

SECTION IV – FACILITY DESIGN (STORAGE)

A. STORAGE AREAS FOR DRUMS / CONTAINERS / TANKS / OTHER DEVICES

1. The current Facility Design for the Asbury Environmental Services – Chico (AES – Chico) facility consists of one tank farm storage area, one drum storage area, and one truck loading and unloading area.

- a) The tank farm storage area consists of:

- An area measured as 36'6" x 17'5 ½".
- One 10,000-gallon, steel, horizontal, above-ground tank, which are 8 feet in diameter and 27 feet 4 inches long
- One 1,000-gallon, steel, horizontal, above-ground tank, which is 4 feet in diameter and 12 feet 3 inches long
- One 500-gallon, steel, horizontal, above-ground tank which is 4 feet in diameter and 6 feet long

The AES - Chico tanks are staged in a parallel setting. See Appendix IV-A, Figure IV-A-2 Transfer Area Site Plan for tank farm storage details.

- b) The drum storage area consist of:

- An area measured as 7'6" x 10' 5.5".
- Area which may contain up to 8 x 55 gallon drums or any size drums not to exceed 440 gallon total capacity.

See Appendix IV-A, Figure IV-A-2 Transfer Area Site Plan for drum storage details.

- c) The current truck loading and unloading area consist of:

- An area measured as 15'4" x 38'4"
- An area which may contain up to a single 6,500 gallon tank truck used for unloading the tanks.

See Appendix IV-A, Figure IV-A-2 Transfer Area Site Plan for current loading and unloading area details.

- d) The future truck loading and unloading area consist of:

- An area measured as 15'4" x 78'4"
- An area which may contain up to a single 6,500 gallon tank truck used for unloading the tanks.

See Appendix IV-A, Figure IV-A-2a Transfer Area Site Plan (Future Containment Slab Extension) for future loading and unloading area details.

2. The AES - Chico tank farm storage and transfer area total dimensions are approximately 638.8 sq ft. The tank farm area measures 36'6" x 17'5 1/2 ", the drum storage area measures 7'6" x 11'10", and the truck loading and unloading area measures 15'4" x 38'4". The height of the tank farm containment wall is 40 inches around the perimeter, the drum storage area containment berm is a 6-inch curb that is 9 1/2 inches high, and the truck Loading and Unloading area containment berm is a 6-inch curb that is 5 inches high.
3. AES - Chico tank farm storage area consist of two above ground tanks and one Public Recycling Do-It-Yourself (DIY) above ground tank. The DIY tank may change service to a permitted waste antifreeze tank.

The drum storage area generally consists of 8 x 55-gallon DOT approved containers, but may contain any size drums not to exceed 440 gallon total capacity.

See Appendix IV-A, Figure IV-A-2 for container storage detail.

4. AES - Chico storage devices are:

Tanks:

- 1 x 10,000 gallon steel, above ground, horizontal tank
- 1 x 1,000 gallon steel, above ground, horizontal tank
- 1 x 500 gallon steel, above ground, horizontal tank

Non-Bulk Containers:

- 85-gallon drum, metal or poly
- 55-gallon drum, metal or poly
- 30-gallon drum, metal or poly
- 5-gallon pails, metal or poly

5. AES - Chico may occasionally stack empty non-bulk storage containers within the drum storage area. When stacking the empty non-bulk storage containers, the empty containers will not be stacked more than two containers high. If containers are stacked two

containers high all containers will be stacked so that the weight and placement of the top stacked containers do not compromise the stability or integrity of the bottom containers. Containers are not stacked on top of containers that do not have a flat or level surface, are unstable, or do not have the strength to withstand the weight of the top container.

Within the drum storage area, a minimum amount of aisle space (30") between rows of non-bulk containers is maintained at all times. See Appendix IV-A, Maps, Figure IV-A-2, Transfer Area Site Plan.

6. All wastes generated by AES - Chico and the wastes associated with types of waste received by AES - Chico are compatible with carbon steel and polyethylene which is the material of construction of the drums. Used Oil/waste oil, waste antifreeze (glycol), and oily water do not cause any negative reactions with carbon steel or polyethylene and serves to protect it from corrosion. The waste materials held in these containers are deemed compatible by the container manufacturers.

All non-bulk containers containing regulated hazardous wastes at AES - Chico meet 49 CFR, Department of Transportation (DOT) requirements.

Tanks are not required to comply with DOT requirements. All tanks are constructed of carbon steel, which is resistant to the types of wastes being stored (oil, antifreeze, and water) and are certified by an independent qualified, California registered engineer.

7. All storage devices at AES - Chico are kept outside.

Non-Bulk containers are elevated using a drum pallet, which elevate the containers from the ground surface.

All of the non-bulk metal containers are protected from the weather with paint and are inspected weekly for any signs of deterioration.

All tanks sit on tank saddles, which elevate the tanks from the ground surface.

All of the metal tanks are protected from the weather with paint and are inspected daily for any signs of deterioration.

8. Liners are not used in any of the storage devices holding hazardous waste.

9. Shipping and receiving logs are used to track the movements of AES - Chico's waste in and waste out activities. In addition, a daily tank inventory is performed each day when the facility is operated.
10. All wastes generated by AES - Chico and the wastes associated with types of waste received, transferred, and stored by AES - Chico are mutually compatible with one another.

All containers are marked or labeled with the name of the waste that is being stored within that container so that only the same waste type is transferred and stored in that container.

11. All non-bulk containers are inspected on a weekly basis for signs of damage such as leaking containers or deterioration of containers and the containment system caused by corrosion, weather, or other factors. If a damaged container is discovered, it will promptly be pumped into an appropriate storage tank, transferred to a DOT approved container, or overpacked in conformance with 49 CFR 173.3.

All containers are kept closed during storage except when waste is added or removed.

All hazardous waste tanks, their foundations, their seismic protection, and associated equipment are visually inspected daily, when the facility is operated, for signs of damage or leakage. This inspection also includes the pipes, pumps, and valves attached to the tanks. During this inspection, the secondary containment area is visually inspected for signs of deterioration, including concrete cracks and gaps. A copy of the AES - Chico inspection sheet is included in Section VII, Inspection Plan, Appendix VII-A.

Regular scheduled drivers assigned to the AES-Chico facility are responsible to perform the daily and weekly inspection. The AES-Chico Facility Manager, located at the Asbury Environmental Service - Dixon facility, is responsible to assure that the inspections are performed, complete, reviewed, and file appropriately.

B. HAZARDOUS WASTES STORED

The table below provides the name and describes the physical properties of each hazardous waste that is or will be stored in each area.

Tank Farm Storage and Drum Storage Area:

Common waste / chemical name(s)	Waste Oil / Used Oil	Oily Water	Spent Antifreeze	Oily Solids
Storage Location	Tank Farm	Tank Farm	Tank Farm	Drum Storage Unit
EPA and/or California hazardous waste number(s)	221, 612	223	133,134, 135, 612	223, 352
Specific gravity	< 1 (0.84–0.96)	0.997 – 1.1	1.0 – 1.2	> 1.1
Vapor pressure, if applicable	<0.53 psi	0.9 psi	0.38 psi	N/A
Organic Vapor pressure, if applicable	0.0008 psi or 0.0055 kPa	0.00003 psi	0.00001 psi	N/A
500 ppm Volatile Organic (VO) Threshold	VO = 1,516 ppm	VO = 18 ppm	VO = 8 ppm	N/A
Flame point/auto-ignition temperature, if applicable	>140° F	>200° F	>200° F	>200° F
pH	> 2 - < 12.5	> 2 - < 12.5	> 2 - < 12.5	3 - 12
Color	Yellow/ Brown/ or Black	Grayish or brownish	Greenish	Brownish / Black

C. STORAGE DEVICE / EQUIPMENT DESCRIPTION

List all devices/equipment to be used in each storage area, including containers, totes, bags, tanks, reactors, vats, etc.

	Tank 1	Tank 2	Tank 3	Drums
Storage Location	Tank Farm	Tank Farm	Tank Farm	Drum Storage Area
External dimensions	8 Ft Diameter	4 Ft Diameter	4 Ft Diameter	Various Sizes depending on

in feet and inches	27.4 ft long	12.3 ft long	6 ft long	the drum volume
Internal design capacity in gallons	10,800	1,000	500	Various Sizes 85 gallon, 55 gallon, 30 gallon, 5 gallon,
Maximum Operating capacity in gallons	10,000	1,000	500	Various Volume depending on the drum size 5 gallons to 85 gallons
Age of each tank	Unknown, Existing Tank Est.24yrs.	Unknown, Existing Tank Est.24yrs.	Unknown, Existing Tank Est.24yrs.	N/A Per DOT Spec.
Coated or lined	Not lined, Tank has exterior paint coating	Not lined, Tank has exterior paint coating	Not lined, Tank has exterior paint coating	Not lined, Drums have exterior paint coating
Minimum Allowable Thickness (inches)	0.216	0.100	0.055	N/A Per DOT Spec.
Minimum Measured Thickness (inches)	0.220	0.125	0.070	N/A Per DOT Spec.

D. SECONDARY CONTAINMENT SYSTEM FOR STORAGE AREAS

The certifications, by an independent professional engineer, for the secondary containment system where liquid wastes are stored are found in Appendix IV-B, Secondary Containment Certification.

Subsection G.2 contains the details for the tank secondary containment system certification and Subsection G.3 contains the details for the Container secondary containment system certification.

E. STORAGE OF IGNITABLE, CORROSIVE, OR REACTIVE HAZARDOUS WASTE

1. The AES - Chico facility does not transfer or store ignitable, corrosive or reactive wastes.
2. All wastes generated by AES - Chico and the wastes associated with types of waste received, transferred, and stored by AES - Chico are mutually compatible with one another.

As an added precaution, AES - Chico requires all trucks to be grounded, using grounding cables, during loading and off-loading transfer operations.

F. SPECIFIED AIR EMISSIONS CONTROLS

Air emission standards for tanks and containers regulations do not apply at AES - Chico since AES - Chico does not treat, store or dispose of RCRA hazardous waste in tanks or containers and the types of hazardous waste stored at the facility have low vapor pressure.

G. ENGINEER'S CERTIFICATION

1. Engineering Certification of Tank Integrity

The engineering certification of Tank Integrity, located in Appendix IV-C, verify that the tanks used to store hazardous wastes at AES - Chico have been adequately designed for this service. Eichleay Engineers Inc. of California, an independent, qualified professional engineer registered in the State of California has prepared tank integrity certifications. The tank integrity certifications includes and addresses the following:

- a. Tanks shall have sufficient shell strength to assure that they do not collapse or rupture. This shall be verified by sonic testing to determine the actual shell thickness of each tank. Actual thicknesses shall be compared to the calculated minimum shell thickness based on operating temperature, pressure, and specific gravities of fluids stored:

The AES - Chico tanks have sufficient shell strength to assure that they do not collapse or rupture. The shell strength was

verified by ultrasonic testing to determine the actual shell thickness of each tank. The actual thickness was compared to the calculated minimum shell thickness based on operating temperature, pressure, and specific gravities of fluids stored.

Tank 1 minimum shell thickness per Eichleay Engineering tank assessment summary is .220". Tomac Ultrasonic (UT) findings indicate UT readings on the shell were .220" to .250" and the heads are from .230" to .250". See Appendix IV-C, Tank Certification, Structural Calculations, Above Ground Tank Assessment, Tank Assessment Summary T-1 and Tomac Ultrasonic (UT) Technique Report Form A1-3.

Tank 2 minimum shell thickness per Eichleay Engineering tank assessment summary is .125". Tomac Ultrasonic (UT) findings indicate UT readings on the shell were .125" to .130" and the heads are from .130" to .250". See Appendix IV-C, Tank Certification, Structural Calculations, Above Ground Tank Assessment, Tank Assessment Summary T-2 and Tomac Ultrasonic (UT) Technique Report Form A1-7.

Tank 3 minimum shell thickness per Eichleay Engineering tank assessment summary is .070". Tomac Ultrasonic (UT) findings indicate UT readings on the shell were .070" to .080" and the heads are from .070" to .080". See Appendix IV-C, Tank Certification, Structural Calculations, Above Ground Tank Assessment, Tank Assessment Summary T-3 and Tomac Ultrasonic (UT) Technique Report Form A1-11.

- b. A statement that the tank material of construction is compatible with the hazardous waste contents:

Certification is provided by an independent, qualified professional engineer registered in the State of California indicating that the tank material of construction is compatible with the hazardous waste(s) to be transferred and stored. See Appendix IV-C, Tank Certification, Structural Calculations, Above Ground Tank Assessment, page 1, second paragraph.

- c. Description of tank system piping (materials of construction, pipe diameter):

The material of construction for the AES - Chico tank system piping is schedule 40 carbon steel 3" pipe for transferring waste

from the tank, and schedule 40 carbon steel 2" pipe for transferring waste into the tank.

The length of schedule 40 carbon steel 3" pipe for transferring waste from tank 1 is 12'.

The length of schedule 40 carbon steel 3" pipe for transferring waste from tank 2 is 3'.

The length of schedule 40 carbon steel 3" pipe for transferring waste from tank 3 is 3'.

The length of schedule 40 carbon steel 2" pipe for transferring waste into tank 1 is 12'5".

The length of schedule 40 carbon steel 2" pipe for transferring waste into tank 2 is 3'.

Tank 3 does not have any piping attached to the tank for transferring waste into tank 3. All waste is manually poured into an opening located on top of the tank.

Piping diagram is shown in Appendix IV-A, Maps, Figure IV-A-2, Transfer Area Site Plan.

d. Description of any internal or external pumps:

The AES - Chico tanks do not have internal pumps. AES used the pumps on the trucks to transfer wastes to and from tanks.

e. Description of design standard(s), if available, according to which tank and ancillary equipment were constructed:

API 579 has been used for recent analysis of the tanks, since no information is available regarding the original design standards to which the tanks were constructed. Equipment design standards (i.e. gauges) are per manufacturing product specifications.

f. Description of any spill prevention or overfill equipment:

Spill prevention and overfill for Tanks 1 and 2 is manually verified by AES - Chico using a sight level gauge.

To prevent overfill, prior to transferring waste from the truck into the tank the Asbury Environmental Service driver/operator will check the shipping and receiving logs, tank logs and visually inspect and verify the tank volume by using a sight level gauge. If the tank has appropriate capacity to contain the volume within

the truck the waste will be transferred, if the tank does not have the appropriate capacity available to contain the volume within the truck the waste is not transferred.

g. Description of any corrosion Protection Measures:

The external tank shells are painted. Paint is used as a corrosion protection measure for the tanks.

h. Description of any structural damage or inadequate construction such as cracks punctures or damaged fittings. All shall be documented in the assessment and remedied before the tank system is certified for use:

All descriptions (external and internal) of any structural damage or inadequate construction such as cracks punctures or damaged fittings have been documented in the assessment. Review of the Ultrasonic Testing revealed no significant corrosion. Results of internal inspection resulted in finding the tanks in good condition with no measurable corrosion or pitting. No remedial action is required. The AES - Chico tank system has been certified for use. See Appendix IV-C, Attachment 1, 653 Tank Inspection Reports by Tomac dated 1/19/03 for T-1, T-2, & T-3.

i. Description of any leak detection equipment:

Visual inspection is used to detect leak, since all tanks sit above-ground on tank saddles, all tanks are elevated above the foundation.

j. Information on the documented age of the tank system.
Estimated remaining service life based on findings:

The age of the tanks 1 and 2 is estimated to be 24 years. However, the corrosion rate will be used in consideration in the Fitness for Service determination. Tank shell thickness results using Ultrasonic testing will be used to determine the corrosion rate of the tank. Ultrasonic testing will be performed every 5 years until a corrosion rate has been determined. Results from each testing year will be compared to the previous year to determine the rate of corrosion.

- k. Leak test report that verifies current tank and attachments integrity:

Tank 1 and Tank 2 have been in constant service since 1991 and are inspected daily; there is no evidence of leakage on or around the tank or tank attachments. Tank shell thickness results using Ultrasonic testing will be used to determine the corrosion rate of the tanks. AES-Chico will schedule Ultrasonic testing to be performed every 5 years until a corrosion rate has been determined. Results from each testing year will be compared to the previous year to determine the rate of corrosion. AES-Chico performed Ultrasonic testing in 2003. Ultrasonic Testing results are located in Appendix IV-C, Tank Certification, Structural Calculations, Above Ground Tank Assessment.

- l. The certification by the independent engineer shall be written in accordance with the format specified in California Code of Regulations (CCR), title 22, section 66270.11(d):

The certifications for Tank Containment and Tank Integrity by Eichleay Engineers Inc. of California is written in accordance with the format specified in California Code of Regulations (CCR), title 22, section 66270.11(d) are included in Appendix IV-C, pages (i) and (ii).

2. Engineering Certification of Tank Secondary Containment

The purpose of the certification of the tanks secondary containment system located in Appendix IV-B is to confirm that there will not be any releases of hazardous waste contents to subsoil or surrounding areas in the event of a tank failure or spillage at AES - Chico.

The AES-Chico tank farm storage area consists of:

- An area measured as 36'6" x 17'5 ½ "
- One 10,000-gallon, steel, horizontal, above-ground tank, which are 8 feet in diameter and 27 feet 4 inches long
- One 1,000-gallon, steel, horizontal, above-ground tank, which is 4 feet in diameter and 12 feet 3 inches long
- One 500-gallon, steel, horizontal, above-ground tank which is 4 feet in diameter and 6 feet long

The secondary containment for the AES - Chico above-ground tank systems includes and addresses the following requirements:

- a. AES - Chico's secondary containment volume (1,382.2 CuFt) exceeds the require volume (1,208.4 CuFt) needed to contain 100% of the largest tank volume, plus the volume of rainfall from a 24-hour, 25-year rainstorm. See Appendix IV-B, Secondary Containment Certification, page 5 of 5 Containment Analysis for actual calculations.
- b. The secondary containment pad and berms are coated with an epoxy acrylic concrete coating, which makes an impervious barrier and prevent migration of spilled liquids.
- c. The epoxy acrylic concrete coating material, used as the coating, is compatible with and resistant to the wastes handled in the tank system.
- d. The AES - Chico secondary containment has sufficient structural strength and thickness to prevent failure due to pressure gradients, physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation. The tank containment berm has been assessed to resist hydrostatic fluid pressure due to full height containment of water. The specific gravity of oil in the containment area is less than that of water. In addition, the full height of fluid pressure is greater than the required containment head. Calculations for design pressure gradients are located in Appendix IV-C, Tank Certification, Structural Calculations. Above Ground Tank Assessment Attachment No. 2, Structural Calculations – Foundation, Anchorage, and Structural Integrity Page A2-17 – A2-19.
- e. The AES - Chico secondary containment foundation is capable of providing support, resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression or uplift. The base is free from cracks or gaps.
- f. The AES - Chico secondary containment system is designed and operated so that visual observation may be used to detect the failure of either the primary or secondary containment structure or the presence of any released of hazardous waste or accumulated liquid in the secondary containment system within 24 hours.
- g. The AES - Chico secondary containment has a slope designed which flows from the north to the south end of the containment

area, and was designed to remove liquids resulting from leaks, spills or precipitation.

- h. AES - Chico is designed and operated to prevent run-on and infiltration of precipitation into the secondary containment system from other areas within the facility.
 - i. The certification for Tank Containment by Eichleay Engineers Inc. of California is written in accordance with the format specified in California Code of Regulations (CCR), title 22, section 66270.11(d) are included in Appendix IV-C, page (i).
3. Engineering Certification of Secondary Containment of Container Storage Areas.

The AES-Chico drum storage area consist of:

- An area measured as 7'6" x 10'5.6"
- Area which may contain up to 8 x 55 gallon drums or any size drums not to exceed 440 gallon total capacity.

The secondary containment for the AES - Chico drum storage area includes and addresses the following requirements:

- a. AES - Chico's drum storage secondary containment volume was based 20% of the aggregate volume of all containers or the volume of the largest container, whichever is greater, plus the volume of rainfall from a 24-hour, 25-year rainstorm.
- b. The drum storage secondary containment pad and berms are coated with an epoxy acrylic concrete coating, which makes an impervious barrier and prevent migration of spilled liquids.
- c. The epoxy acrylic concrete coating material is compatible with and resistant to the wastes handled in the drum storage area.
- d. The AES - Chico drum storage secondary containment has sufficient structural strength and thickness to prevent failure due to pressure gradients, physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation. The AES - Chico drum storage secondary containment berm has been assessed to resist hydrostatic fluid pressure due to full eight containment of water. The specific gravity of oil in the containment area is less that that of water. In addition, the full height of fluid

pressure is greater than the required containment head. See Appendix IV-B, Secondary Containment Certification.

- e. The AES - Chico drum storage secondary containment foundation is capable of providing support, resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression or uplift. The base is free from cracks or gaps.
 - f. The AES - Chico drum storage secondary containment system is designed and operated so that visual observation may be used to detect the failure of either the primary or secondary containment structure or the presence of any released of hazardous waste or accumulated liquid in the secondary containment system within 24 hours.
 - g. The AES - Chico drum storage secondary containment has a slope designed which flows from the north to the south end of the containment area, and was designed to remove liquids resulting from leaks, spills or precipitation.
 - h. AES - Chico drum storage is designed and operated to prevent run-on and infiltration of precipitation into the secondary containment system from other areas within the facility. Run on is prevented by existing containment walls and berms.
 - i. The certification for Secondary Containment by Eichleay Engineers Inc. of California is written in accordance with the format specified in California Code of Regulations (CCR), title 22, section 66270.11(d) are included in Appendix IV-B, Secondary Containment Certification, pages 2 through 5.
4. Engineering Certification of Compliance with Seismic Standards

The Structural Calculations, Above Ground Tank Assessment, includes calculations to show that supporting tank structures are of sufficient strength to withstand a seismic event is located in Appendix IV-C. The calculation includes a ground acceleration factor based on current earthquake fault data, the Alquist-Priolo Earthquake Fault Zones, in the vicinity of the facility.

H. ENGINEER'S QUALIFICATION

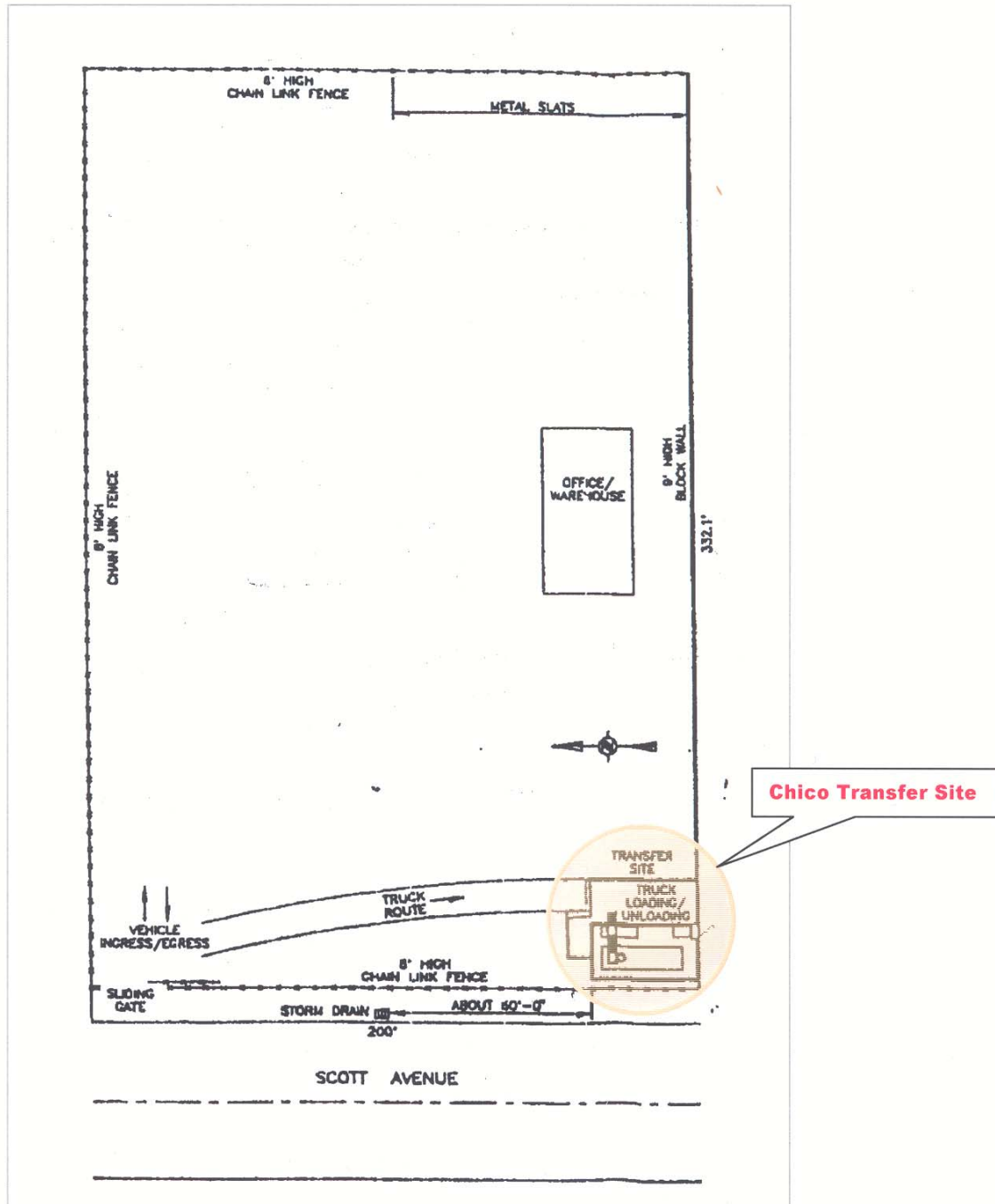
Ron Wise, SE
Eichleay Engineers Inc. of California
1390 Willow Pass Road, Suite 600
Concord, California 94520
Registration Number: S2401
Registration Expiration Date: 3.31.09

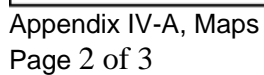
Appendix IV-A

Maps

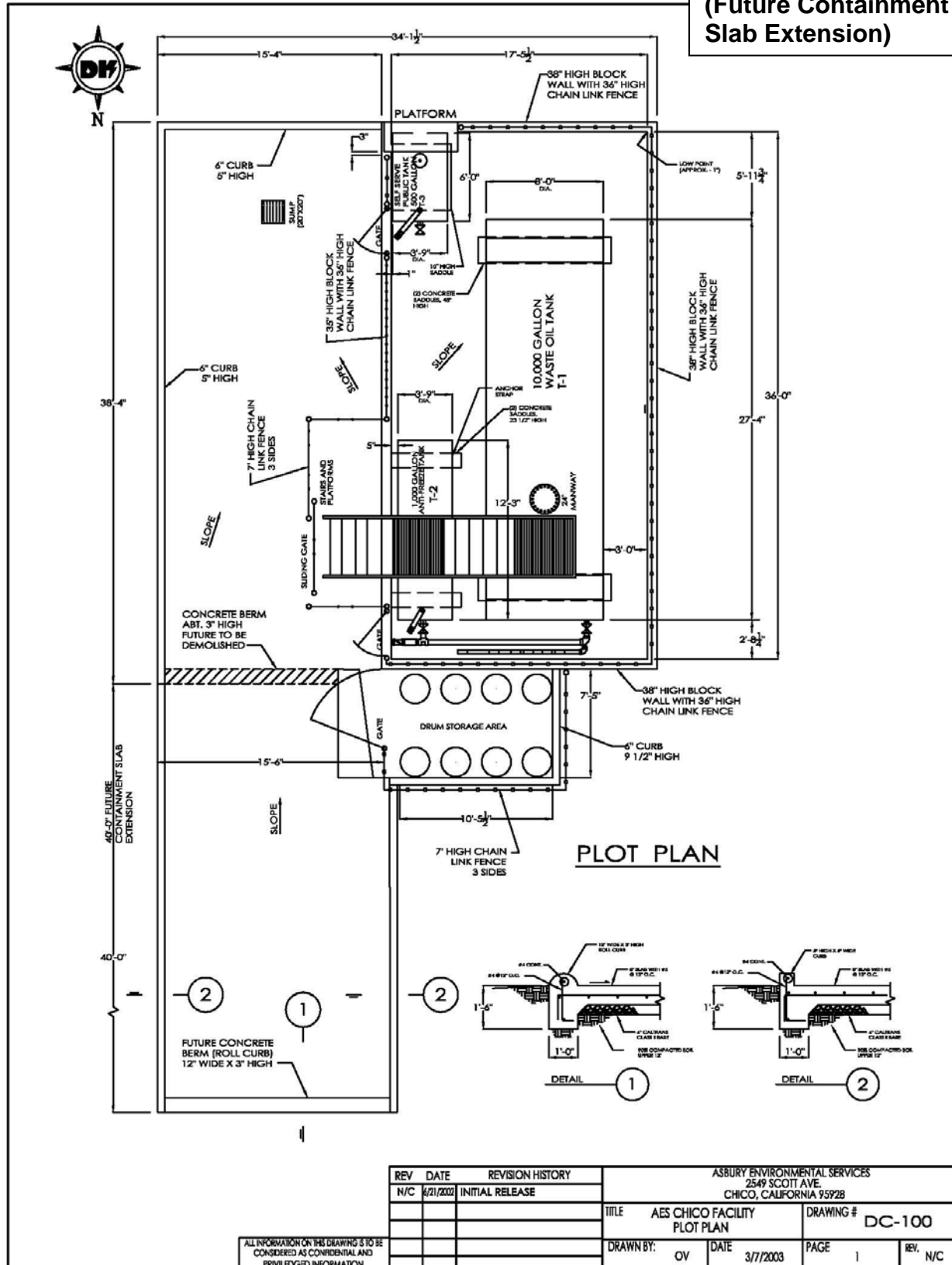
**Figure IV-A-1
Facility Plot Plan/Legal
Boundary Map**

Asbury Environmental Services
2549 Scott Avenue
Chico, CA 95928





**Figure IV-A-2a
Transfer Area Site Plan
(Future Containment
Slab Extension)**



Appendix IV-B

Secondary Containment Certification

Appendix IV-C

Tank Certification, Structural Calculations, Above Ground Tank Assessment



**Asbury Environmental Services
2549 Scott Avenue
Chico, CA 95928**

**Chico Transfer Site
Containment Certification**

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Eichleay

Eichleay Engineers Inc. of California

ISO 9001
REGISTERED COMPANY

February 28, 2003

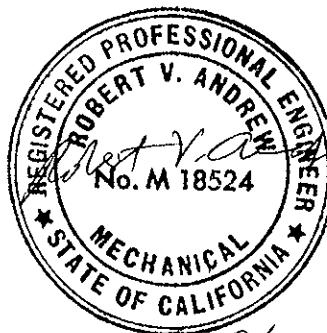
Asbury Environmental Services
2549 Scott Avenue
Chico, CA 95928
EPA ID Number CAL 000 827 844

**Containment Certification
Chico Transfer Site**

I hereby certify that I have examined the facility and being familiar with the provisions of CCR Title 22, Section 66264.193 attest that containment volumes for tank farm areas at Asbury Environmental's Chico Transfer Site are suitably designed and constructed to containment volume requirements of CCR Title 22, Section 66264.193.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment for knowing violations.

Robert V. Andrew, PE
Mechanical No. 18524
Expires 9/30/06



Exp 9/30/06

**Asbury Environmental
Chico Transfer Site****Containment Evaluation**Purpose of Evaluation

The following evaluation is provided to determine the containment areas at Asbury Environmental Chico Transfer Site meet the requirements of CCR Title 22, Section 66264.193.

Containment capacities are calculated for the following areas:

Tank Farm containing 1-10,000 Gal, 1-1,000 Gal, and 1-500 Gal tanks.

Drum Storage containing up to 9 55 Gal drums.

The basis by which these calculations were completed and a summary of calculations are included herein. Existing containment capacities are compared to requirements of CCR Title 22, Section 66264.193. Detailed calculations for each area are on file at Asbury Environmental.

Basis of Calculations

1. Tank farm containment must be provided to retain a volume equal to or greater than the sum of:
 - a) 10% of the total volume of all tanks within the containment area, or 100% of the largest tank – whichever is greater, plus
 - b) rainfall accumulation within the perimeter of containment for a 25 year – 24 hour storm. This equals 4.03" of rainfall based on the California Department of Water Resources Rainfall Depth-Duration-Frequency for Chico, and adopted by the City of Chico, California.
2. Containment calculations for each area is based on:
 - a) minimum existing height of walls or curbs
 - b) finish grade elevation within the containment areas
 - c) total area enclosed by the containment walls or curbs.
3. Existing containment walls and curbs prevent storm water from migrating from the rest of the facility into tank farm containment areas.

Summary

Description	Containment Required (Cu Ft)	Containment Available (Cu Ft)	Percent Containment
Drum Storage	33.8	42.4	125
Tank Farm	1208.4	1382.2	114

Conclusions

1. The available containment volumes have been calculated on the following pages. The results of these calculations are given above as a ratio of the available containment volume to the required containment volume.

Tank farm containment volumes meet the requirements of CCR Title 22, Section 66264.193.
2. All run-on from accumulated precipitation outside containment areas, is prevented by existing containment walls and curbs.

**Asbury Environmental
Chico Transfer Site**

Design Certification

The design of the containment areas will be reviewed by a registered professional engineer for compliance with CCR Title 22, Section 66264.193. The following items will be specifically addressed as part of the review.

Containment System

1. Tank farms used for the storage of hazardous wastes shall be provided with an impervious concrete base. The concrete base shall be designed such that it is free from cracks and gaps, and shall be constructed on a compacted sub-base of sufficient density to prevent settlement. Construction joints shall be sealed using embedded water stops, impervious caulking, or by other suitable means to prevent leaks from penetrating the base.
2. The base shall be sloped to direct any accumulated liquids away from the tanks, or the tanks shall be elevated above the base using legs or skirts.
3. The containment volume shall be sized to contain 100 percent of the largest tank volume, or 10 percent of the aggregate volume of all tanks within the containment area, whichever is greater. For locations exposed to precipitation, additional containment shall be provided for the accumulation of rainfall from a 25-year, 24-hour storm.
4. Storm water shall be prevented from migrating into tank farms from outside the containment area by directing storm water away from these areas and by existing containment systems.

Engineering Review

1. Inspection of the tank farm containment area and drum storage area showed a concrete base of 10" with no settlement, cracking, or gaps. Containment walls of the tank farm have been coated and sealed.
2. In the tank farm, all tanks were elevated on support saddles. The containment area has a slight slope to the floor slab.
3. Containment volumes have been evaluated as noted within this report and meet the requirements for tank/drum containment and rainfall.
4. Existing containment systems prevent the migration of storm water into the tank farm and drum storage areas.

Reference Drawings

Drawing Title	Appendix
Facility Plot Plan	1
Site Plan	2



Asbury Environmental
Chico Transfer Site

Containment Analysis

Tank and Containment Data

Tank Data				
Area		Diameter	Length/Height	Volume (Cu Ft)
Tank Farm	T-1	95.5"	27'-4" L	1359.5
	T-2	47"	12'-3" L	147.6
	T-3	45.75"	6'-1" L	69.5
Drum Storage	55 Gal Drum	24"	2'-4" H	7.35

Tank Farm

Total Volume of All Tanks	1576.6 Cu Ft	
10% of Total Volume of All Tanks	157.7 Cu Ft	
Volume of Largest Tank	1359.5 Cu Ft	Governs for Containment Requirements
Net Volume of Largest Tank Above Containment Level	993.8 Cu Ft	

Drum Storage

Total Volume of 8 Drums	58.8 Cu Ft	
10% of Total Volume of All Drums	5.88 Cu Ft	
Volume of Largest Drum	7.35 Cu Ft	Governs for Containment Requirements

Containment Calculations

Tank Farm:

Tank Farm Area =	638.8 Sq Ft
Containment Wall Height =	38"
Containment Volume =	2022.9 Cu Ft
Less Volume of All Tanks and Saddles Within Containment Space =	(640.7) Cu Ft
Net Containment Volume Available =	1382.2 Cu Ft
25-Year, 24- Hour Rainfall =	4.03"
Volume of Rainfall Accumulation =	214.6 Cu Ft

Summary of Tank Farm Containment Calculations:

Required Tank Volume Containment	993.8 Cu Ft
Required Rainfall Containment Volume	214.6 Cu Ft
Total Required Containment Volume	1208.4 Cu Ft
Containment Volume Available	1382.2 Cu Ft
Percent Containment	114%

Drum Storage:

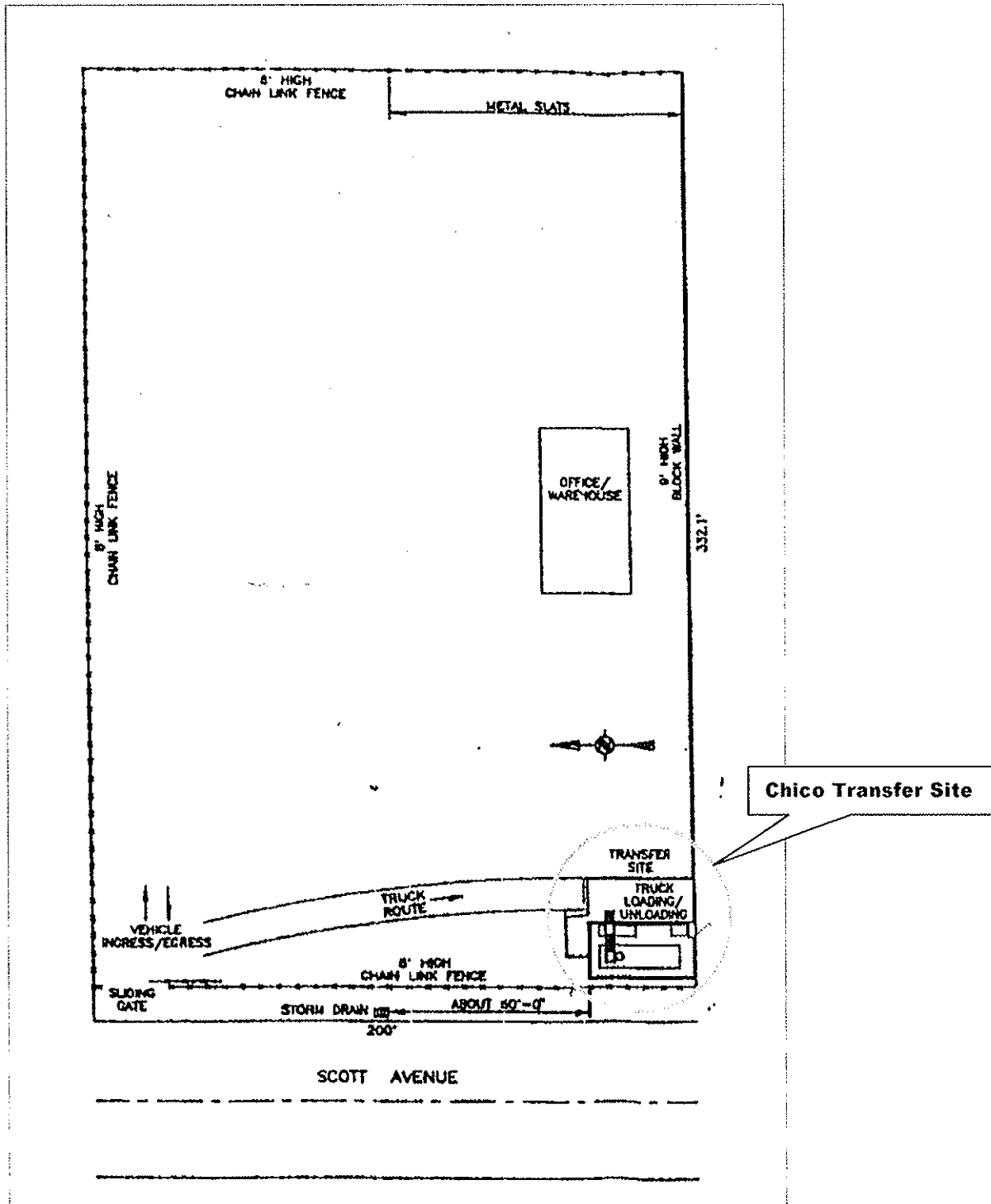
Drum Storage Area =	78.8 Sq Ft
Containment Curb Height =	9.5"
Containment Volume =	62.3 Cu Ft
Less Volume of All Drums, Ramp Within Containment Space =	(19.9) Cu Ft
Net Containment Volume Available =	42.4 Cu Ft
25-Year, 24- Hour Rainfall =	4.03"
Volume of Rainfall Accumulation =	26.5 Cu Ft

Summary of Drum Storage Containment Calculations:

Required Drum Volume Containment	7.35 Cu Ft
Required Rainfall Containment Volume	26.5 Cu Ft
Total Required Containment Volume	33.8 Cu Ft
Containment Volume Available	42.4 Cu Ft
Percent Containment	125%

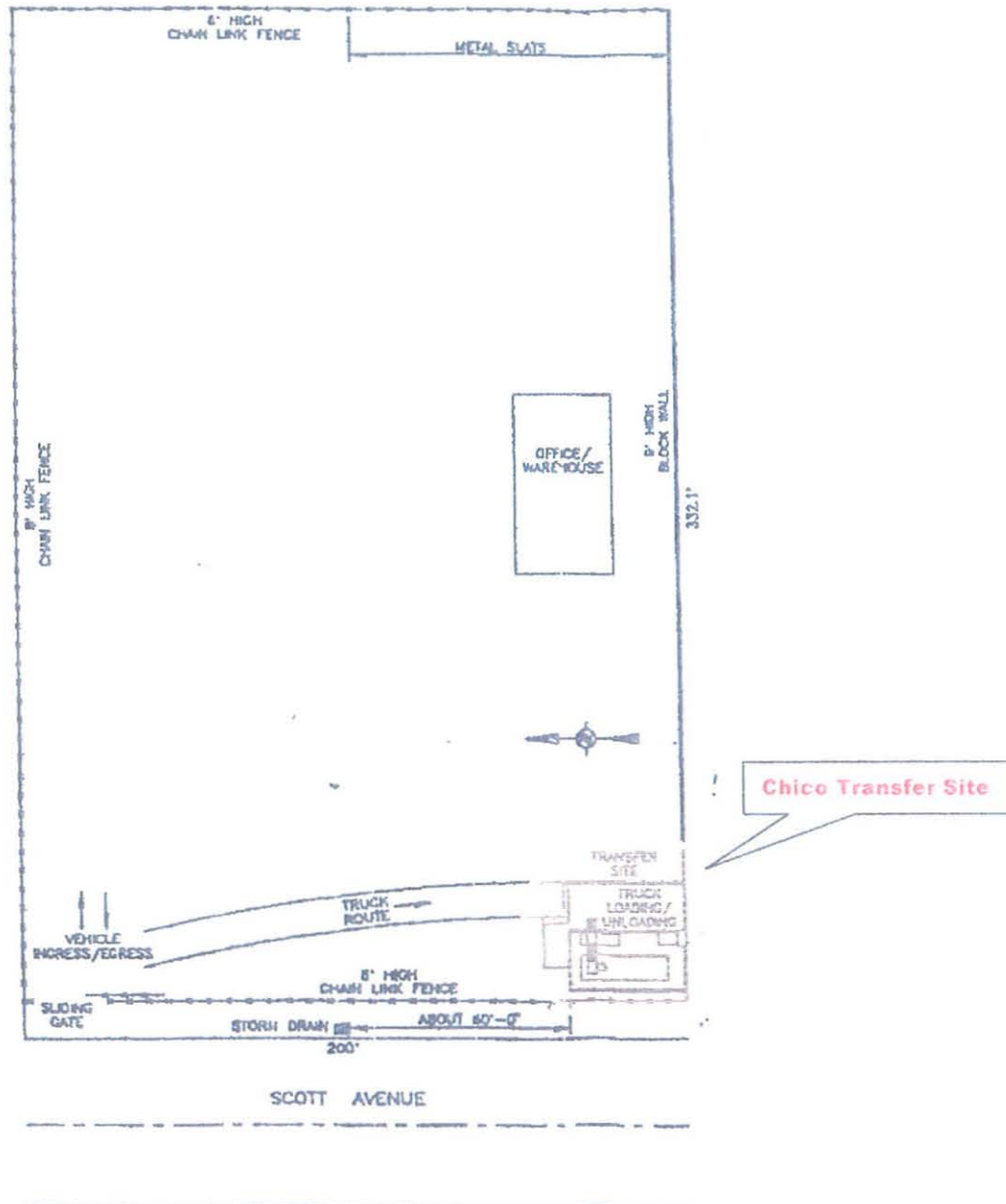
FACILITY PLOT PLAN

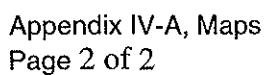
Asbury Environmental Services
2549 Scott Avenue
Chico, CA 95928



**Figure IV-A-1
Facility Plot Plan/Legal
Boundary Map**

Asbury Environmental Services
2549 Scott Avenue
Chico, CA 95928







March 31, 2008

Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928
EPA ID Number CAL 000 827 844

Tank Containment Certification

In accordance with the requirements of CCR Title 22, Section 66264.193 –*Containment and Detection of Releases*, a tank containment has been completed for the following:

- One 10,000-gallon storage tanks referred to as T-1.
- One 1,000-gallon storage tank referred to as T-2.
- One 500-gallon storage tank referred to as T-3.

It was noted in Figure IV-A-2, Transfer Area Site Plan, that the truck containment slab will be extended an additional 40 feet as part of a future project. It was also noted that the existing truck containment slab has some cracking which needs to be repaired.

Tank containment was certified as meeting the above referenced requirements in February 2003. I have reviewed those documents, inspected the containment at the site, and do not find any conditions, except for those noted above, which in my judgment would alter the previous assessment. The 2003 containment certification and supporting documents can be found in Attachment 1 of this document, following this certification.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment for knowing violations.

Ron Wise

Ron Wise, SE
Structural License No. S2401
Expires 3/31/09





March 31, 2008

Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928
EPA ID Number CAL 000 827 844

Tank Integrity Certification

In accordance with the requirements of CCR Title 22, Section 66264.191 – *Assessment of Existing Tank System's Integrity*, a tank assessment has been completed for the following:

- One 10,000 gallon storage tanks referred to as T-1.
- One 1,000 gallon storage tank referred to as T-2.
- One 500 gallon storage tank referred to as T-3.

Based on the "Cities and Counties Affected by Alquist-Priolo Earthquake Fault Zones as of May 1, 1999, Chico, there are no active faults within 3,000 feet of this site.

All tanks were certified as fit for service in February 2003. I have reviewed those documents, inspected the tanks at the site, and do not find any conditions, which in my judgment would alter the previous assessment. The 2003 tank certification and supporting documents can be found in Attachment 1 of this document, following this certification.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment for knowing violations.

Ron Wise, SE
Structural License No. S2401
Expires 3/31/09



February 28, 2003

Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928
EPA ID Number CAL 000 827 844

Tank Assessment Part 'B' Certification

In accordance with the requirements of CCR Title 22, Section 66264.191 – *Assessment of Existing Tank System's Integrity*, a tank assessment has been completed for the following:

- ◆ 10,000 gallon horizontal storage tank supported on two concrete saddles used for storage of used oil. Tank is referred to as T-1 in Tomac's Inspection Report.
- ◆ 1,000 gallon horizontal storage tank supported on two concrete saddles used for storage of waste antifreeze/waste glycol. Tank is referred to as T-2 in Tomac's Inspection Report.
- ◆ 500 gallon horizontal storage tank supported on one elongated concrete saddle used for storage of used oil. Tank is referred to as T-3 in Tomac's Inspection Report.

All tanks are housed within a single containment area. This tank containment system is the subject of a separate assessment and certification. This assessment has shown that the tank system is adequately designed, and has sufficient structural strength and compatibility with the waste(s) to be transferred, stored or treated to insure that the tanks will not collapse, rupture or fail. This inspection has included ultrasonic testing and an external visual inspection.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment for knowing violations.

Samar H. Adranly, S.E.
Structural License No. S003647
Expires 12/31/05





Eichleay

Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928

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2.	Facility Plot Plan	2
3.	As-Built Site Plan	3
4.	Tank Assessment Summary T-1	4
5.	Tank Assessment Summary T-2	5
6.	Tank Assessment Summary T-3	6
Attachment No. 1	653 Tank Inspection Reports by Tomac dated 1/19/03	A1-1 through A1-12
Attachment No. 2	Structural Calculations – Foundation, Anchorage, & Structural Integrity	A2-0 through A2-19
Attachment No. 3	Excerpts from Chico General Plan – Flood & Seismicity	A3-1 & A3-2



Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928

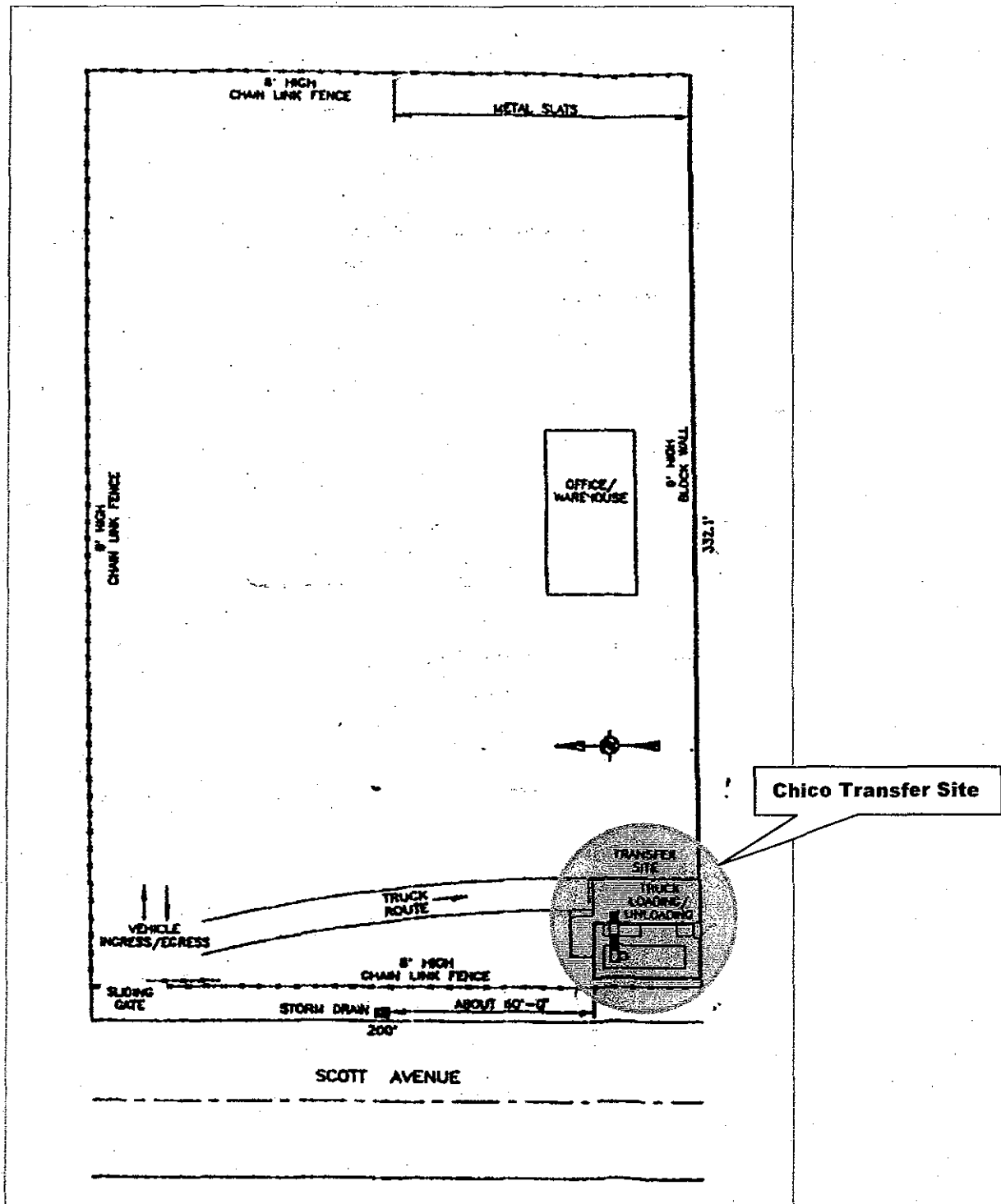
Basis of Tank Assessment

Basis of field inspection procedures and calculations contained in this Tank Assessment are outlined below:

1. Tank Inspections have been performed based on requirements of *API 653 – Tank Inspection, Alteration, Repair, and Reconstruction* using modified inspection procedures as outlined in API 653. An external visual inspection as well as ultrasonic thickness measurement for each tank has been taken. Tank Inspection Reports are provided in Attachment No. 1. In comparing the thickness measurements with those previously taken in 1997 (CONAM Inspection Report, July 1997), the 10,000 gallon (T-1) and 500 gallon (T-3) tanks show no corrosion has taken place in the last 5 years. The 1,000 gallon tank (T-2) currently in place was installed after the July 1997 Inspection. Refer to individual Tank Assessment Summary sheets.
2. The site was retrofitted in 1998 and included the following improvements:
 - ◆ New 1,000 gallon tank (T-2) to replace existing tank.
 - ◆ New/retrofitted concrete saddles and anchor straps for both the 10,000 gallon and 1,000 gallon tanks.
 - ◆ Placement of Coating at saddles and containment walls.
3. Maximum stresses in the tanks have been calculated using actual dimensions and thickness from UT. The Zick Analysis method for horizontal vessels supported on saddles was utilized for this calculation. Structural Integrity Calculations are included in Attachment No. 2.
4. Foundation and anchorage calculations are provided for the 10,000 gallon tank (T-1). Calculations demonstrate the foundation and tank anchorage is adequate for support of the 10,000 gallon tank (T-1). Foundations and anchorage for T-2 & T-3 are similar to T-1 and are deemed adequate by inspection. Foundation and anchorage calculations are based on UBC criteria in Seismic Zone 3. Calculations are included in Attachment No. 2.
5. Based on information from the City of Chico General Plan (1994), the site is not located within a 100 year flood plan and there are no active faults within 3,000 feet of the site. (See excerpts provided in Attachment No. 3.

FACILITY PLOT PLAN

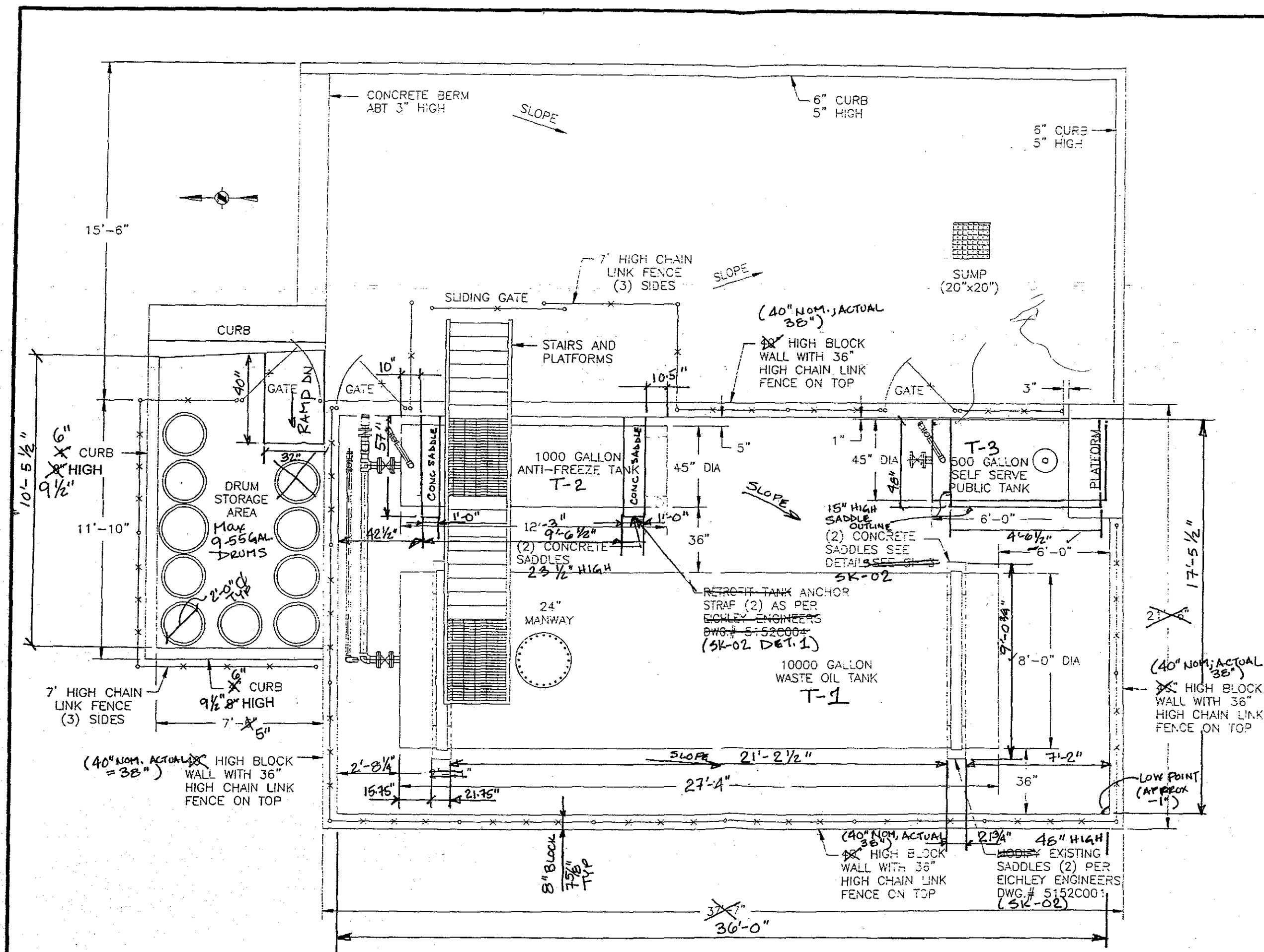
Asbury Environmental Services
2549 Scott Avenue
Chico, CA 95928



SK-01

PRJ. # 90000 PRJ # 30558

SCALE	SCORE	NAME	DATE	ADDRESS	STATE	CITY
NONE	0	00000	1	001	3	2 4





TANK ASSESSMENT SUMMARY

TANK ID NO. T-1 **DATE OF ASSESSMENT** 1/31/03
DIMENSIONS 95.5" O.D. / Length – 27' 4" **CAPACITY** 10,000 gallon
TANK CONTENTS Used oil/oily water; Maximum Specific Gravity: 1.0
DESIGN STANDARD Unknown **AGE OF TANK** Unknown
NAME PLATE DATA Unknown
MATERIAL OF CONSTRUCTION Carbon steel

FIELD INSPECTION DATA: Tomac Inspection Report – Attachment No. 1

DATE OF INSPECTION 1/19/03
MINIMUM SHELL THICKNESS .220"
CORROSION PROTECTION MEASURES External Paint System

STRUCTURAL SUPPORTS, FOUNDATIONS, ANCHORAGE: Horizontal Tank Supported on two concrete saddles and mat foundation. Tank is anchored to foundation by flat plate straps and anchor bolts.

STRUCTURAL INTEGRITY OF TANK SHELL – Calculated per Zick Analysis (See Attachment No. 2)
Maximum Shell Stress is below allowable stress.

SEISMIC/WIND LOADING CALCULATIONS – Foundation and anchorage calculations have been performed in accordance with Uniform Building Code Requirements in Seismic Zone 3. (See Attachment No. 2) Wind does not govern design.

Tank complies with these requirements.



TANK ASSESSMENT SUMMARY

TANK ID NO. T-2 **DATE OF ASSESSMENT** 1/31/03

DIMENSIONS 47" O.D. / Length: 12' -3" **CAPACITY** 1,000 gallon

TANK CONTENTS Waste Antifreeze/Waste Glycol; Maximum Specific Gravity 1.3

DESIGN STANDARD Unknown **AGE OF TANK** Unknown

NAME PLATE DATA Unknown

MATERIAL OF CONSTRUCTION Carbon steel

FIELD INSPECTION DATA: Tomac Inspection Report – See Attachment No. 1

DATE OF INSPECTION 1/19/03

MINIMUM SHELL THICKNESS .125"

CORROSION PROTECTION MEASURES External Paint System

STRUCTURAL SUPPORTS, FOUNDATIONS, ANCHORAGE: Horizontal Tank Supported on two concrete saddles and mat foundation. Tank is anchored to foundation by flat plate straps and anchor bolts.

STRUCTURAL INTEGRITY OF TANK SHELL – Calculated per Zick Analysis (See Attachment No. 2)
Maximum Shell Stress is below allowable stress.

SEISMIC/WIND LOADING CALCULATIONS – Foundation and anchorage is similar to T-1 and are deemed adequate by inspection.

Tank complies with these requirements.



TANK ASSESSMENT SUMMARY

TANK ID NO. T-3 **DATE OF ASSESSMENT** 1/31/03
DIMENSIONS 45 3/4" O.D. / Length: 73" **CAPACITY** 500 gallon
TANK CONTENTS Used Oil/Oily Water; Maximum Specific Gravity 1.0
DESIGN STANDARD Unknown **AGE OF TANK** Unknown
NAME PLATE DATA Unknown
MATERIAL OF CONSTRUCTION Carbon steel

FIELD INSPECTION DATA: Tomac Inspection Report – See Attachment No. 1

DATE OF INSPECTION 1/19/03
MINIMUM SHELL THICKNESS .070"
CORROSION PROTECTION MEASURES Exterior Paint System

STRUCTURAL SUPPORTS, FOUNDATIONS, ANCHORAGE: Horizontal Tank Supported on a continuous saddle. Tank is anchored to foundation by embedded steel plates.

STRUCTURAL INTEGRITY OF TANK SHELL – Calculated per Roark Article 12.7 (See Attachment No. 2)

Maximum Shell Stress is below allowable stress.

SEISMIC/WIND LOADING CALCULATIONS – Foundation and anchorage is similar to T-1 and are deemed adequate by inspection.

Tank complies with these requirements.



**Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928**

Attachment No. 1

653 Tank Inspection Reports by Tomac dated 1/19/03 for T-1, T-2, & T-3



653 Tank Inspection Report T-1

A1-1

Type: Horizontal Tank
Diameter: 95.5" O.D. Length: 27' 4"
Stock: Used Oil/Oily Water
Year Built: Unknown
Material: Carbon Steel (grade unknown)
Cathodic Protected: No
Design Standard: Unknown
Capacity: 10,000 Gal

Customer: Asbury Environmental Service

Location: 2549 Scott Av.
Chico, Ca 95928

Date: 1/19/2003

EXTERNAL

1). SHELL

A. Coating or Insulation
B. Weld Seams/Rivets
C. Nozzles/Re-pads
D. Manways/Re-pads
E. Davits
F. Ground Wire
G. Anchor Bolts
H. Name Plate.

2). FOUNDATION

A. Concrete/Pad
B. Bottom Extension (Chime)
C. Drain Opening
D. Settlement
E. Secondary Containment

3). APPURTENANCE

A. Auto Gagewell
B. Valves
C. Mixers
D. Other

4). STRUCTURE

A. Stairway/Ladders
B. Platform/Handrail

5). ROOF

A. Coating or Insulation
B. Weld Seam/Rivets
C. Sample Hatch & Guide
D. Vacuum Breakers
E. Nozzles
F. Manways
G. Breathers & Vents
H. Other

INTERNAL

6). SHELL

A. Walls
B. Roof (bottom side)
C. Welds Seams/Rivets
D. Nozzles/Manways
E. Gasket Surface

7). BOTTOM

A. Floor/Lining
B. Weld Seams
C. Ware Plates
D. Sump

8). APPURTENANCE

A. Piping Manifold
B. Heater
C. Mixer
D. Gagewell
E. Other

9). STRUCTURE

A. Structure
B. Rafters
C. Girders
D. Trusses

10). RECOMMENDATIONS

BACKGROUND

This report documents and provides an evaluation of the inspection results per the applicable criteria of API-653 1995 with 1999 addendum. There is no history of previous inspection, when the tank was built or what code it was built to.

EXTERNAL

Shell:

The tank paint was found in good condition with no peeling or damage. There was indication of previous general corrosion/pitting with an average of 10-20 mils and a high of 80 mils. The area next to the 80 mil pit was UT'd at .240". Other than some areas with previous corrosion/pitting to 30 mils, the horizontal and circumferential welds seams were all found in fair condition with no obvious defects or indications of leakage. The coating on the east and west heads were also in good condition. The east head had random areas of previous corrosion/pitting, with an average of 10-20 and a max of 70 mils. This head was UT'd at 24"-25". The west head had previous corrosion/pitting, with an average of 10-20 and a max of 50 mils. This head was UT'd at 23"-24". No banding or peaking was found. No indication of out-of-round noted. The nozzles and couplings appeared in good condition with the paint intact and no corrosion or pitting. The manway appeared in good condition with no corrosion or pitting found and the paint was intact. There are no davits on the shell. There was no ground wire found. The anchor bolts, which were embedded into the concrete pedestals, were all hammer tested and found to be sound. The two hold down straps were found in secured with no corrosion or damage. The concrete pedestals were found in good condition with no spalling or cracks. No nameplate was found. Review of the UT readings revealed no significant corrosion.

Foundation:

The concrete pad appeared in good condition with no relevant cracks or spalling. There was no vegetation problem found. No indication of settlement could be visually noted. This inspector took no settlement measurements. No indication of bottom leakage noted. The containment walls shared with two other tanks were found in fair condition with no spalling or cracks.

Signature:

Inspector: John Montanez - API 653 #1285 / CWI #89010701

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653 Tank

Inspection Report

T-1

A1-2

Type: Horizontal Tank
Diameter: 95.5" O.D. Length: 27' 4"
Stock: Used Oil/Oily Water
Year Built: Unknown
Material: Carbon Steel (grade unknown)
Cathodic Protected: No
Design Standard: Unknown
Capacity: 10,000 Gal

Customer: Asbury Environmental Service

Location: 2549 Scott Av.
Chico, Ca 95928

Date: 1/19/2003

EXTERNAL CONT.

Appurtenance:

The auto gauge showed 6" when it should have been 0". The 3" valve on the east side appeared in good condition with no indication of leakage.

Structure:

The stairway, platforms and handrails associated with this tank were found in good condition with no corrosion or pitting.

INTERNAL

SHELL:

The shell ID was found in good condition with no measurable corrosion or pitting. The east and west heads were in the same condition as the shell. The horizontal connections were found with lap joints with no welds on the ID. The circumferential joints were butt welded, however they were not full pen welds but were stitch welded. The manway ID's and the cover ID's were in good condition with no corrosion or pitting noted. The manway gasket surface was found in good condition with no dings or nicks. The nozzle ID's were also found with no corrosion or pitting. The nozzles and manway were not full pen welds.

APPURTENANCE:


The 1 1/2" internal piping was hammer tested and found to be in sound condition. The auto gauge float appeared in sound condition with no noticeable leakage. The guide wires were in good condition with no twisting or fraying noted.

STRUCTURE

There were no rafters, girders, lateral bracing or center column associated with this tank.

Recommendations:

- 1). Consider re-calibrating the auto gauge.
- 2). Perform ultrasonic test and external visual inspection in five years.

Signature: 

Inspector: John Montanez - API 653 #1285 / CWI #89010701

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Ultrasonic Technique Report Form

A1-3

Customer:

Ashbury Environmental Service
2549 Scott Av.
Chico, Ca 95928

General Information

Part Name:

Used Oil/Oily Water

Piece Number:

T-1

Part Material: Carbon Steel

Procedure: TM-UT-5

Codes: N/A

Test Equipment

Instrument Used: U.S.K. 7/DMS-2

Angle Used: Straight Beam/Pitch Catch

Search Unit: .50" Dia. 5 MHz Pulse Echo

Couplant: Ultra Gel

Sketch:

Customer P.O.:

Job Number:

TM Number: 03-003 **Date:** 1/19/2003

Description Of Calibration:

.10", .30" and .50" carbon steel step block using 3 linear
backs on a 2" screen

Configuration To Be Examined:

Vessel

Scanning Technique:

Spot Check

Surface Preparation: None

Surface Condition: Good

Findings:

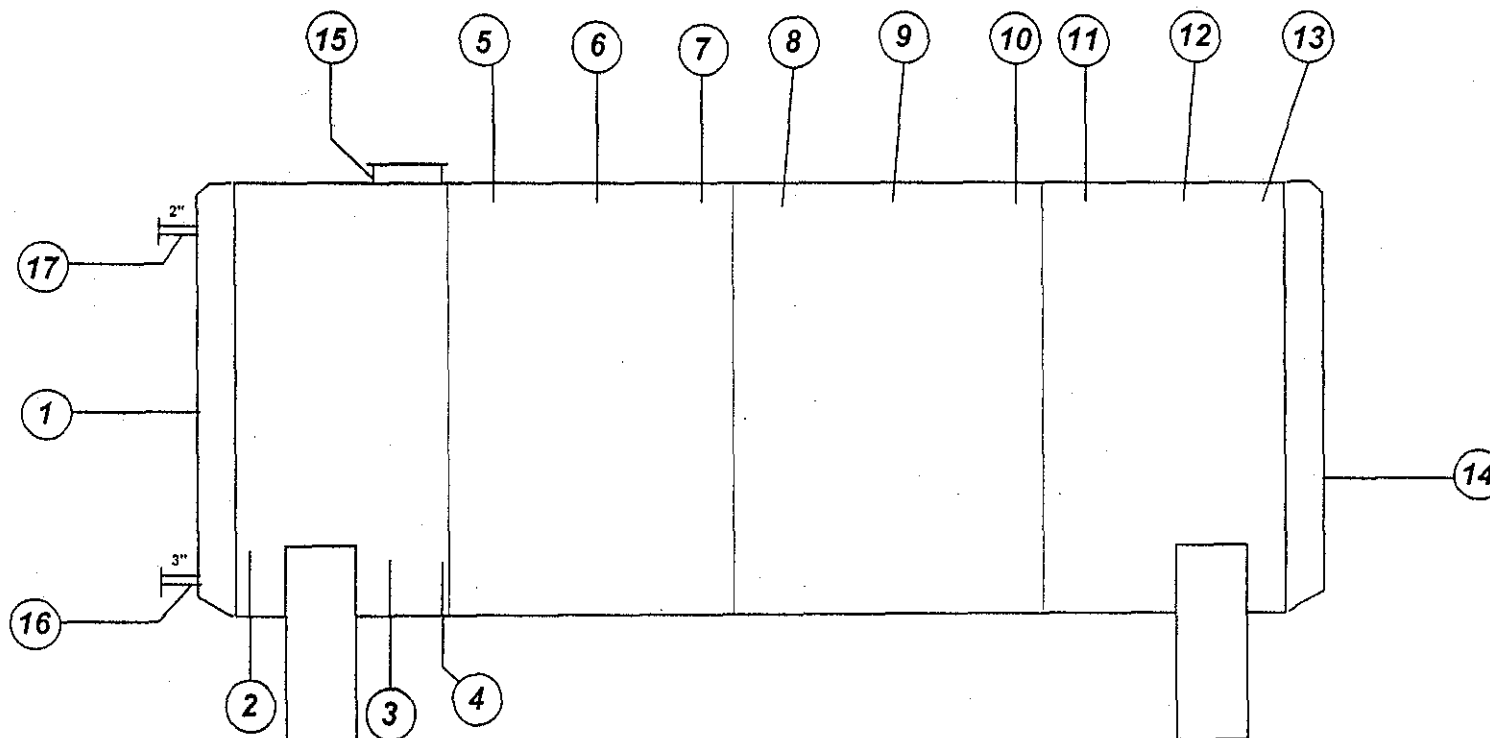
The UT readings on the shell were from .220" to .250", the
heads were from .230" to .250", the 3" nozzle was .195" to
.200" and the 2" nozzles was from .200" to .210". No ID
pitting was noted. See drawing attached.

Technician: John Montanez *[Signature]* **Level:** II
CWI# 89010701

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TANK # T-1
CARBON STEEL
 95'-5" O.D.
 27' 4" L

USED OIL



1) T - .240" N - .245" B - .240" S - .250" C - .250"	2) T - .240" N - .245" B - .240" S - .245"	3) T - .250" N - .250" B - .245" S - .250"	4) T - .240" N - .245" B - .240" S - .250"	5) T - .240" N - .240" B - .240" S - .240"	6) T - .250" N - .245" B - .240" S - .245"	7) T - .240" N - .240" B - .240" S - .245"	8) T - .240" N - .235" B - .240" S - .235"	9) T - .240" N - .245" B - .240" S - .245"
10) T - .235" N - .235" B - .240" S - .235"	11) T - .240" N - .235" B - .240" S - .235"	12) T - .240" N - .240" B - .240" S - .240"	13) T - .220" N - .230" B - .230" S - .235"	14) T - .240" N - .240" B - .230" S - .240" C - .240"	15) N - .240" E - N/A" S - .240" W - N/A"	16) T - .195" N - .200" B - .200" S - .195"	17) T - .210" N - .210" B - .200" S - .210"	

ASBURY ENVIRONMENTAL Inc. 2549 Scott, CA 95928		Ultrasonic Thickness Inspection	
TANK NO. T - 1		DATE: 1-19-2003	TM: 14-T1
INSPECTED BY: J. MONTANEZ		Tomac NDT Services, Inc. 11642 KNOTT AVE. SUITE #4 TEL: 1-800-273-0091 GARDEN GROVE, CA 92641 FAX: 714-698-6172	

At-4



653 Tank

Inspection Report

T-2

A1-5

Type: Horizontal Tank
Diameter: 47" O.D. Length: 12' 3"
Stock: Antifreeze/Waste Coolant
Year Built: Unknown
Material: Carbon Steel (grade unknown)
Cathodic Protected: No
Design Standard: Unknown
Capacity: 1000 Gal

Customer: Asbury Environmental Service

Location: 2549 Scott Av.
Chico, Ca 95928

Date: 1/19/2003

EXTERNAL

INTERNAL

1). SHELL

A. Coating or Insulation
B. Weld Seams/Rivets
C. Nozzles/Re-pads
D. Manways/Re-pads
E. Davits
F. Ground Wire
G. Anchor Bolts
H. Name Plate.

2). FOUNDATION

A. Concrete/Pad
B. Bottom Extension (Chime)
C. Drain Opening
D. Settlement
E. Secondary Containment

4). STRUCTURE

A. Stairway/Ladders
B. Platform/Handrail

5). ROOF

A. Coating or Insulation
B. Weld Seam/Rivets
C. Sample Hatch & Guide
D. Vacuum Breakers
E. Nozzles
F. Manways
G. Breathers & Vents
H. Other

6). SHELL

A. Walls
B. Roof (bottom side)
C. Welds Seams/Rivets
D. Nozzles/Manways
E. Gasket Surface

7). BOTTOM

A. Floor/Lining
B. Weld Seams
C. Ware Plates
D. Sump

8). APPURTENANCE

A. Piping Manifold
B. Heater
C. Mixer
D. Gagewell
E. Other

9). STRUCTURE

A. Structure
B. Rafters
C. Girders
D. Trusses

10). RECOMMENDATIONS

BACKGROUND

This report documents and provides an evaluation of the inspection results per the applicable criteria of API-653 1995 with 1999 addendum. There is no history of previous inspection, when the tank was built or what code it was built to.

EXTERNAL

Shell:

The tank paint was found to be in good condition with no peeling or damage. The horizontal and circumferential welds seams were all found in good condition with no obvious defects or indications of leakage. The coating on the east and west heads were found in the same condition as the shell. No banding or peaking was found. No indication of out-of-round noted. The nozzles and couplings appeared in good condition with the paint intact and no corrosion or pitting. The manway appeared in good condition with no corrosion or pitting found and the paint was intact. There are no davits on the shell. There was no ground wire found. The anchor bolts, which were embedded into the concrete pedestals, were all hammer tested and found to be sound. The two hold down straps were found in secured with no corrosion or damage. The concrete pedestals were found in good condition with no spalling or cracks. No nameplate was found. Review of the UT readings revealed no significant corrosion.

Foundation:

The concrete pad appeared in good condition with no relevant cracks or spalling. There was no vegetation problem found. No indication of settlement could be visually noted. This inspector took no settlement measurements. No indication of bottom leakage noted. The containment walls shared with two other tanks were found in fair condition with no spalling or cracks.

Appurtenance:

The auto gauge showed 2" when it should have been 0". The 3" valve on the east side appeared in good condition with no indication of leakage.

Signature: 

Inspector: John Montanez - API 653 #1285 / CWI #89010701

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Page 1 of 2



653 Tank Inspection Report T-2

A1-6

Type: Horizontal Tank
Diameter: 47" O.D. Length: 12' 3"
Stock: Antifreeze/Waste Coolant
Year Built: Unknown
Material: Carbon Steel (grade unknown)
Cathodic Protected: No
Design Standard: Unknown
Capacity: 1000 Gal

Customer: Asbury Environmental Service

Location: 2549 Scott Av.
Chico, Ca 95928

Date: 1/19/2003

EXTERNAL CONT.

Structure:

There was no stairway, platforms or handrails associated with this tank.

INTERNAL

SHELL:

The shell ID was found to be in excellent condition with no corrosion or pitting. The east and west heads were in the same condition as the shell. The horizontal and circumferential connections were found with lap joints with no welds on the ID. The manway ID's and the cover ID's were in good condition with no corrosion or pitting noted. The manway gasket surface was found in good condition with no dings or nicks. The nozzle ID's were also found with no corrosion or pitting. The nozzles and manway were not full pen welds.

APPURTENANCE:

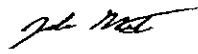
The 1 1/4" internal piping was hammer tested and found to be in sound condition. The auto gauge float appeared in sound condition with no noticeable leakage. The guide wires were in good condition with no twisting or fraying noted.

STRUCTURE

There were no rafters, girders, lateral bracing or center column associated with this tank.

Recommendations:

- 1). Consider re-calibrating the auto gauge.
- 2). Perform ultrasonic test and external visual inspection in five years.

Signature: 

Inspector: John Montanez - API 653 #1285 / CWI #89010701

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Ultrasonic Technique Report Form

A1-7

Customer:

Ashbury Environmental Service
2549 Scott Av.
Chico, Ca 95928

General Information

Part Name:

Waste Antifreeze/Waste Glycol

Piece Number:

T-2

Part Material: Carbon Steel

Procedure: TM-UT-5

Codes: N/A

Test Equipment

Instrument Used: U.S.K. 7/DMS-2

Angle Used: Straight Beam/Pitch Catch

Search Unit: .50" Dia. 5 MHz Pulse Echo

Couplant: Ultra Gel

Sketch:

Customer P.O.:

Job Number:

TM Number: 03-004 **Date:** 1/19/2003

Description Of Calibration:

.10", .30" and .50" carbon steel step block using 3 linear
backs on a 2" screen

Configuration To Be Examined:

Vessel

Scanning Technique:

Spot Check

Surface Preparation: None

Surface Condition: Good

Findings:

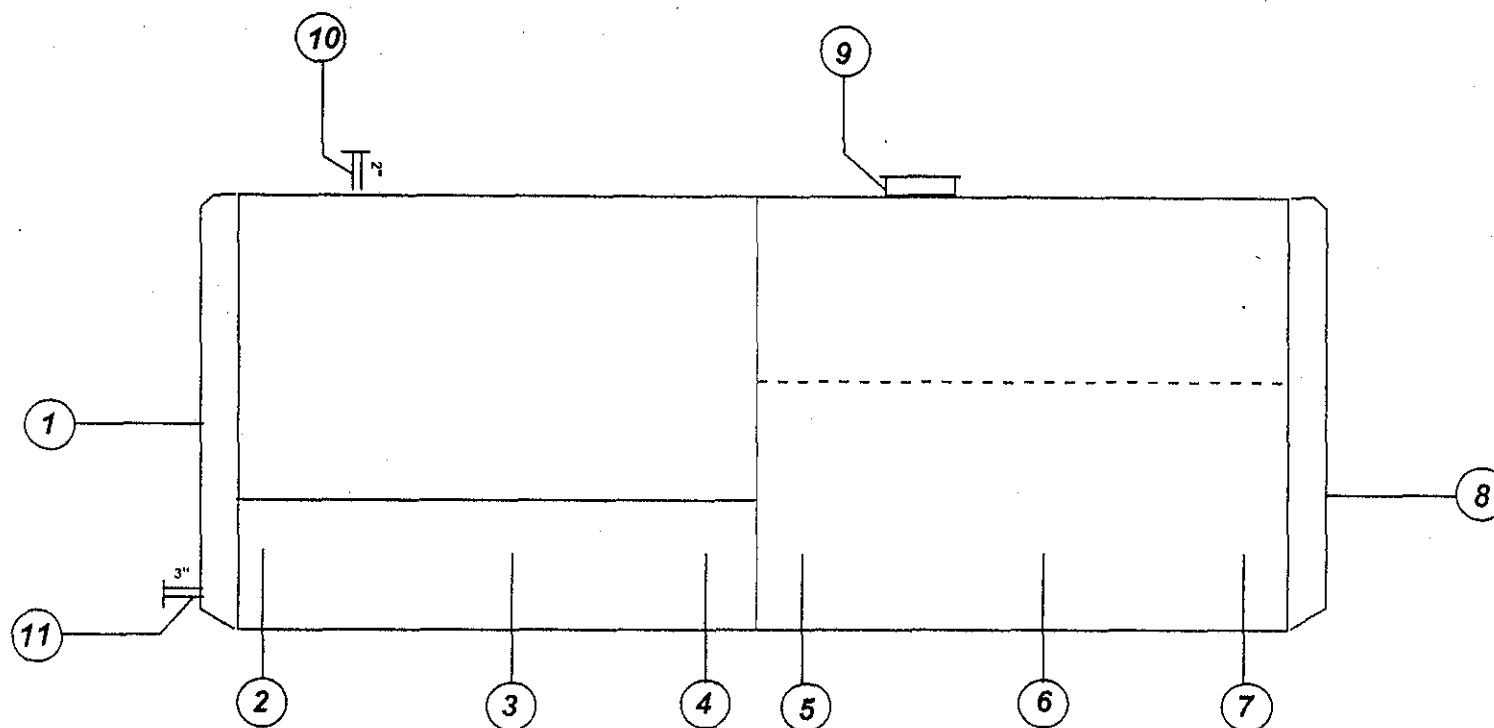
The UT readings on the shell were from .125" to .130", the
heads were also from .25" to .130", the 3" nozzle was all
.200" and the 2" nozzles was from .140" to .150". No
pitting was noted. See drawing attached.

Technician: John Montanez *John Montanez* **Level:** II
CWI# 89010701

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TANK # T-2
CARBON STEEL
 47" O.D.
 12' 3" L

WASTE ANTIFREEZE / WASTE GLYCOL



- 1) T - .125"
 N - .125"
 S - .125"
 C - .125"
- 2) T - .130"
 N - .130"
 S - .125"
 C - .125"
- 3) T - .130"
 N - .130"
 S - .125"
 C - .125"
- 4) T - .130"
 N - .130"
 S - .125"
 C - .125"
- 5) T - .125"
 N - .125"
 S - .125"
 C - .130"
- 6) T - .130"
 N - .130"
 S - .125"
 C - .130"
- 7) T - .130"
 N - .130"
 S - .125"
- 8) T - .130"
 N - .130"
 S - .130"
 C - .130"
- 9) N - .240"
 E - .240"
 S - .240"
 W - .240"
- 10) N - .150"
 S - .150"
 E - .140"
 W - .140"

ASBURY ENVIRONMENTAL Inc. 2549 Scott, CA 95928		Ultrasonic Thickness Inspection	
TANK NO. T - 2		DATE: 1-19-2003	TM: 14-T2
INSPECTED BY: J. MONTANEZ		Tomac NDT Services, Inc. 11642 KNOTT AVE. SUITE #4 TEL: 1-800-273-0091 GARDEN GROVE, CA 92641 FAX: 714-896-4172	



653 Tank

Inspection Report

T-3

A1-9

Type: Horizontal Tank
Diameter: 45 3/4" O.D. Length: 73"
Stock: Used Oil/Oily Water
Year Built: Unknown
Material: Carbon Steel (grade unknown)
Cathodic Protected: No
Design Standard: Unknown
Capacity: 500 Gal

Customer: Asbury Environmental Service

Location: 2549 Scott Av.
Chico, Ca 95928

Date: 1/19/2003

EXTERNAL

1). SHELL

A. Coating or Insulation
B. Weld Seams/Rivets
C. Nozzles/Re-pads
D. Manways/Re-pads
E. Davits
F. Ground Wire
G. Anchor Bolts
H. Name Plate.

2). FOUNDATION

A. Concrete/Pad
B. Bottom Extension (Chime)
C. Drain Opening
D. Settlement
E. Secondary Containment

3). APPURTENANCE

A. Auto Gagewell
B. Valves
C. Mixers
D. Other

4). STRUCTURE

A. Stairway/Ladders
B. Platform/Handrail

5). ROOF

A. Coating or Insulation
B. Weld Seam/Rivets
C. Sample Hatch & Guide
D. Vacuum Breakers
E. Nozzles
F. Manways
G. Breathers & Vents
H. Other

INTERNAL

6). SHELL

A. Walls
B. Roof (bottom side)
C. Welds Seams/Rivets
D. Nozzles/Manways
E. Gasket Surface

7). BOTTOM

A. Floor/Lining
B. Weld Seams
C. Ware Plates
D. Sump

8). APPURTENANCE

A. Piping Manifold
B. Heater
C. Mixer
D. Gagewell
E. Other

9). STRUCTURE

A. Structure
B. Rafters
C. Girders
D. Trusses

10). RECOMMENTIONS

BACKGROUND

This report documents and provides an evaluation of the inspection results per the applicable criteria of API-653 1995 with 1999 addendum. There is no history of previous inspection, when the tank was built or what code it was built to.

EXTERNAL (In-service)

Shell:

The tank paint was found to have a few cracks and a few spots where it had chipped off. This inspector was informed that these chipped areas would be repainted. The horizontal and circumferential weld seams were all found in good condition with no obvious defects or indications of leakage. The coating on the east and west heads were found in fair condition. No banding or peaking was found. No indication of out-of-round noted. The nozzles and couplings appeared in good condition with the paint intact and no corrosion or pitting. There are no manways or davits on the shell. There was no ground wire found. There were no anchor bolts. The concrete pedestal was found in good condition with no spalling or cracks. No nameplate was found. Review of the UT readings revealed an average thickness of .070".

Foundation:

The concrete pad appeared in good condition with no relevant cracks or spalling. There was no vegetation problem found. No indication of settlement could be visually noted. This inspector took no settlement measurements. No indication of bottom leakage noted. The containment walls shared with two other tanks were found in fair condition with no spalling or cracks.

Appurtenance:

The hopper/funnel was intact with no damage noted. The air vent was found plugged and was removed, cleaned and re-installed.

Signature: 

Inspector: John Montanez - API 653 #1285 / CWI #89010701

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Page 1 of 2



653 Tank Inspection Report T-3

AI-10

Type: Horizontal Tank
Diameter: 45 3/4" O.D. Length: 73"
Stock: Used Oil/Oily Water
Year Built: Unknown
Material: Carbon Steel (grade unknown)
Cathodic Protected: No
Design Standard: Unknown
Capacity: 500 Gal

Customer: Asbury Environmental Service

Location: 2549 Scott Av.
Chico, Ca 95928

Date: 1/19/2003

EXTERNAL CONT.

Structure:


The stairway, platforms and handrails associated with this tank were found in good condition with no corrosion or pitting.

INTERNAL

No internal inspection conducted:

Recommendations:

- 1). Engineering should review the UT readings and determine the serviceability of the tank.
- 2). Perform ultrasonic test and external visual inspection in five years.

Signature: 

Inspector: John Montanez - API 653 #1285 / CWI #89010701

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Ultrasonic Technique Report Form

A1-11

Customer:

Asbury Environmental Service
2549 Scott Av.
Chico, Ca 95928

General Information

Part Name:

Used Oil/Oily Water

Piece Number:

T-3

Part Material: Carbon Steel

Procedure: TM-UT-5

Codes: N/A

Test Equipment

Instrument Used: U.S.K. 7/DMS-2

Angle Used: Straight Beam/Pitch Catch

Search Unit: .50" Dia. 5 MHz Pulse Echo

Couplant: Ultra Gel

Sketch:

Customer P.O.:

Job Number:

TM Number: 03-002 **Date:** 1/19/2003

Description Of Calibration:

.10", .30" and .50" carbon steel step block using 3 linear
backs on a 2" screen

Configuration To Be Examined:

Vessel

Scanning Technique:

Spot Check

Surface Preparation: None

Surface Condition: Good

Findings:

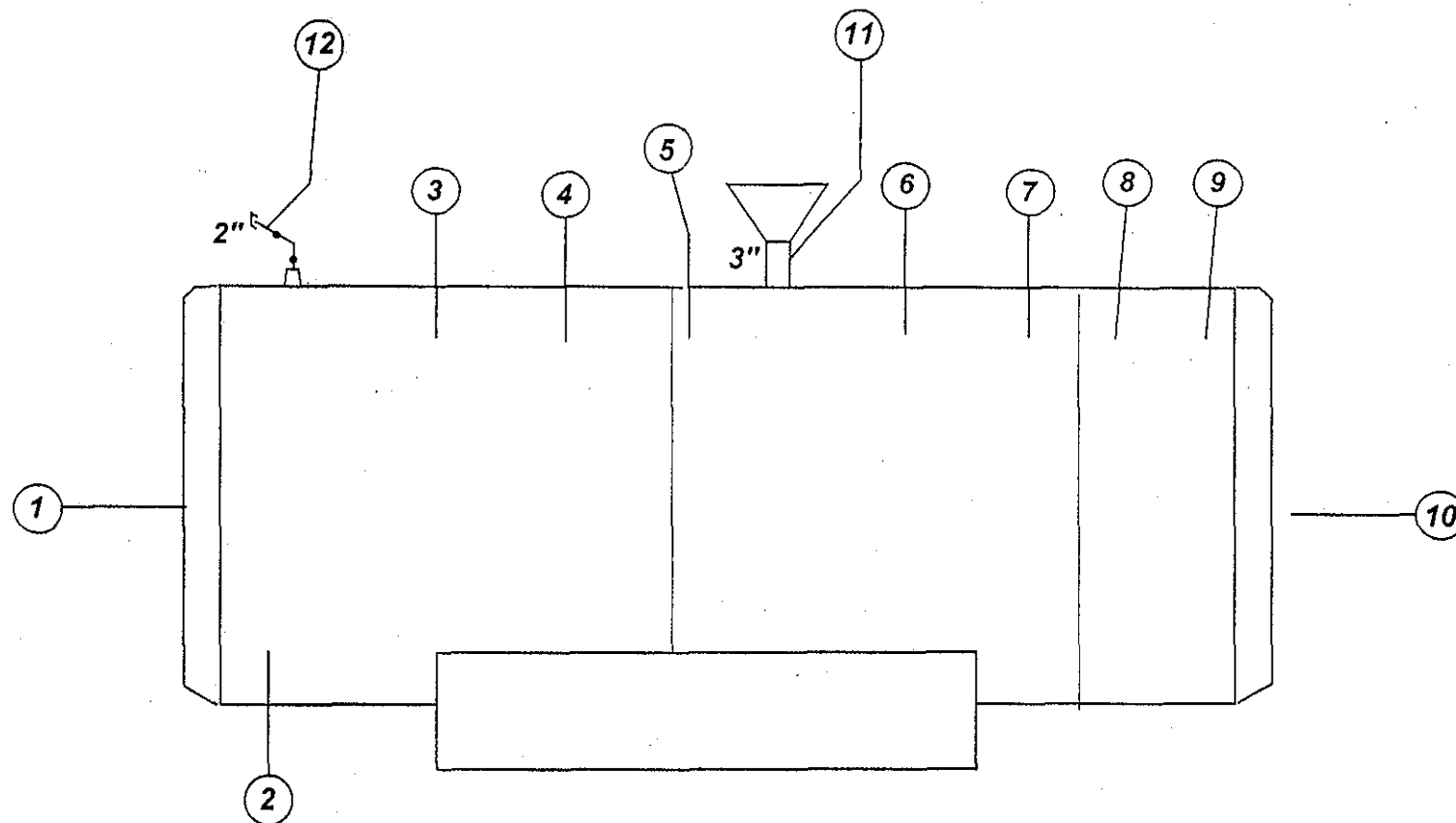
The UT readings on the shell were from .070" to .080", the
heads were also from .070" to .080, the 3" nozzle was all
.060" and the 2" nozzles was from .140" to .160". No
pitting was noted. See drawing attached.

Technician: John Montanez *[Signature]* **Level:** 11
CWI# 89010701

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TANK # T-3
CARBON STEEL
 45'-3/4" O.D.
 73" L

USED OIL



1) T - .240" N - .245" B - .240" S - .250" C - .250"	2) T - .240" N - .245" B - .240" S - .245"	3) T - .250" N - .250" B - .245" S - .250"	4) T - .240" N - .245" B - .240" S - .250"	5) T - .240" N - .240" B - .240" S - .240"	6) T - .250" N - .245" B - .240" S - .245"	7) T - .240" N - .240" B - .240" S - .245"	8) T - .240" N - .235" B - .240" S - .235"	9) T - .240" N - .245" B - .240" S - .245"
10) T - .235" N - .235" B - .240" S - .235"	11) T - .240" N - .235" B - .240" S - .235"	12) T - .240" N - .240" B - .240" S - .240"	13) T - .220" N - .230" B - .230" S - .235"	14) T - .240" N - .240" B - .230" S - .240" C - .240"	15) N - .240" E - N/A" S - .240" W - N/A"	16) T - .195" N - .200" B - .200" S - .195"	17) T - .210" N - .210" B - .200" S - .210"	

ASBURY ENVIRONMENTAL Inc. 2549 Scott, CA 95928		Ultrasonic Thickness Inspection	
TANK NO.	T - 3	DATE:	1-19-2003
INSPECTED BY:	J. MONTANEZ	TM:	14-T3
		Tomac NDT Services, Inc. 11642 KNOTT AVE, SUITE #4 TEL: 1-800-273-0091 GARDEN GROVE, CA 92641 FAX: 714-896-8172	

A1-12

**Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928**

Attachment No. 2

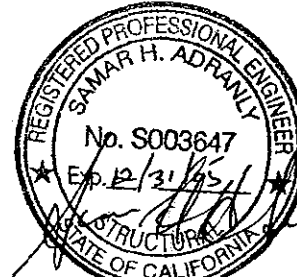
**Structural Calculations
Foundation, Anchorage, & Structural Integrity
For T-1, T-2, T-3**

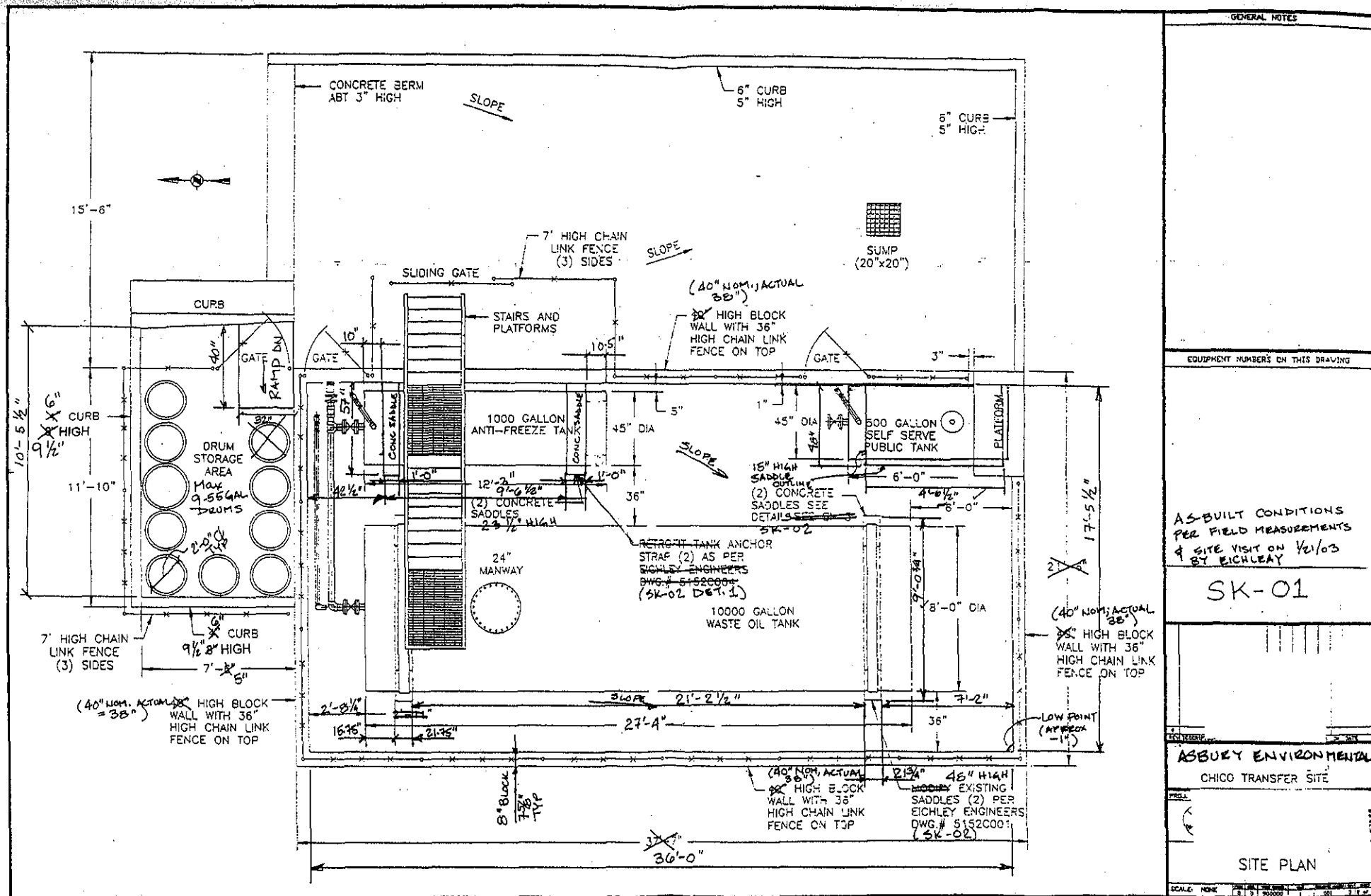


Eichleay

A2-0

Calculation Cover Sheet

Job No:	30558	Discipline:	Structural	No. of Sheets:	19
Title					
Client:	Asbury Environmental Services		Project Location:	Chico Transfer Site 2549 Scott Avenue Chico, CA 95928	
Subject					
Assess Structural Adequacy of Tanks, Tank Anchorage, and Foundation					
Table of Contents					
Subject		Page Nos.			
1. Anchorage & Foundation Check for 10,000 gallon tank, T-1		1-10			
2. Strap Design – 10,000 gallon tank, T-1		11-12			
3. Structural Integrity Tank Shell – 10,000 gallon, T-1		13			
4. Structural Integrity Tank Shell – 1,000 gallon, T-2		14			
5. Structural Integrity Tank Shell – 500 gallon, T-3		15-16			
6. Check of Containment Wall		17-19			
Design Criteria					
Seismic Load based on 1994 UBC. Seismic base shear is consistent with value obtained using formula within the most current code – 2001 California Building Code.					
Sources of Formula & References					
Check of Tank Shell based on "Stresses in Large Horizontal Cylindrical Pressure Vessels on Two Saddle Supports" by L.P. Zick, otherwise known as Zick Analysis					
PV Elite Analysis of 10,000 gallon vessel performed in 1998					
Roark 5 th Edition, Article 12.7					
Preliminary Calculation <input type="checkbox"/>			Final Calculation <input checked="" type="checkbox"/>		
0	1/30/03	R. Sitjar/S. Adranly	S. Adranly	1/31/03	
Revision	Date	Calculation By	Checked By	Date	Approved By



$$V = 10,000 \text{ gallons } 8'-0" \phi \times 27'-4" \text{ 0.25 in shell}$$

$$W_T = 83,420 + 8280 = 91,700 \text{ lb}$$

DL

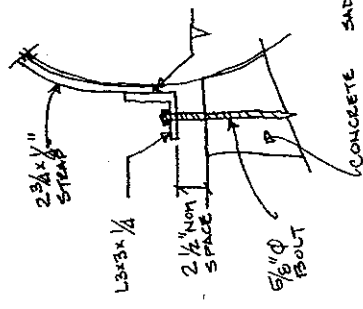
STRUCTURAL INTEGRITY OF
10,000 GALLON WASTE OIL TANK

A2-1
RJS 30558
1/19

2/19

STRUCTURAL INTEGRITY OF
10,000 GALLON WASTE OIL TANK

LONGITUDINAL SEISMIC



DETAIL 1
NS
LONGITUDINAL SEISMIC (1994UBC)

$$V_x = \frac{E I C}{R W} W_p$$

$$Z = 0.3 \text{ (ZONES)}$$

$$I = 1.25$$

$$R W = 3$$

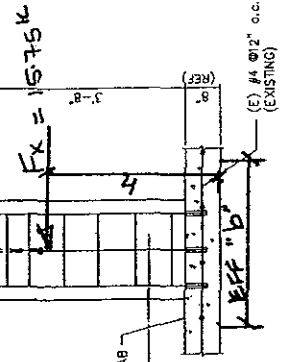
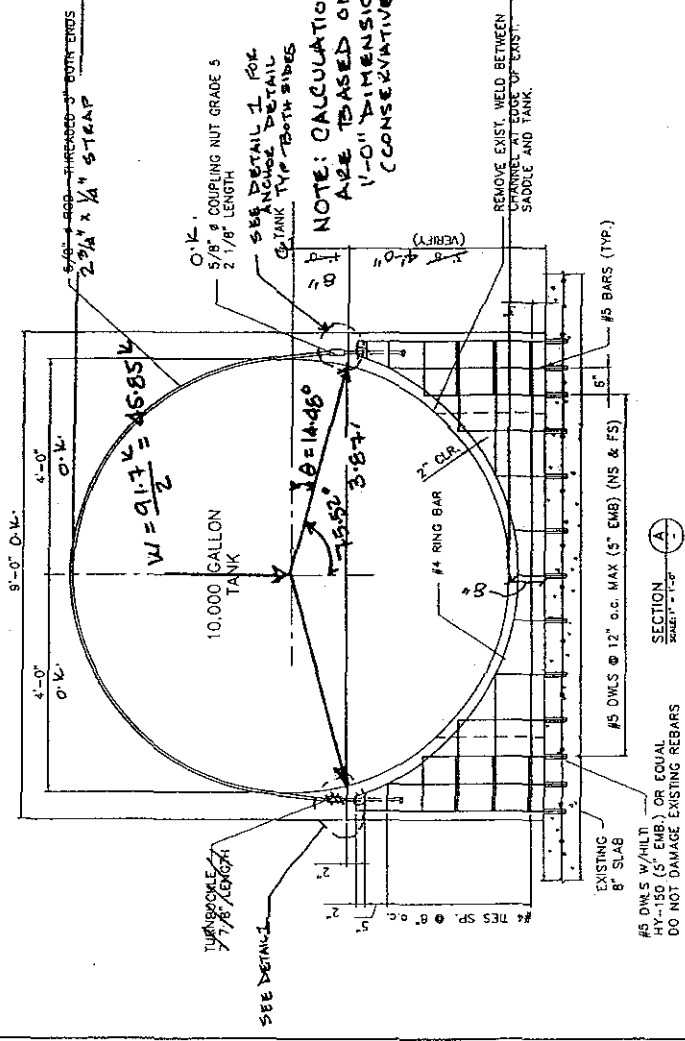
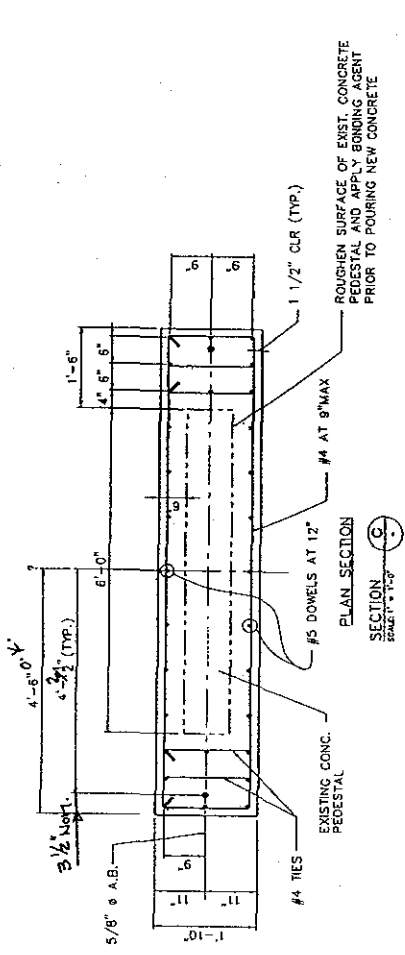
$$W_p = 91.7/2 = 45.85 K$$

$$C = 2.75$$

$$V_x = 15.75 K$$

NOTE: THIS IS CONSISTENT W/
VALUE FOR DESIGN BASE SHEAR
PER 1901 SEC

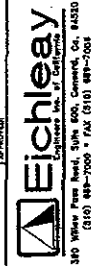
NOTE: CALCULATIONS
ARE BASED ON
1'-0" DIMENSION
(CONSERVATIVE)



- NOTES:**
1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
 2. REINFORCING STEEL SHALL BE ASTM A615 GRADE 60.
 3. BONDING AGENT SHALL BE USED ON ALL REINFORCERS CONCRETE SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 4. DOVEL BARS SHALL BE INSTALLED WITH HILT HY-150 ADHESIVE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 5. ANCHOR BOLTS SHALL BE ASTM A-307.

AS-BUILT CONDITIONS
PER FIELD MEASUREMENTS
& SITE VISIT ON
1/21/03 BY EICHELEY

5K-02

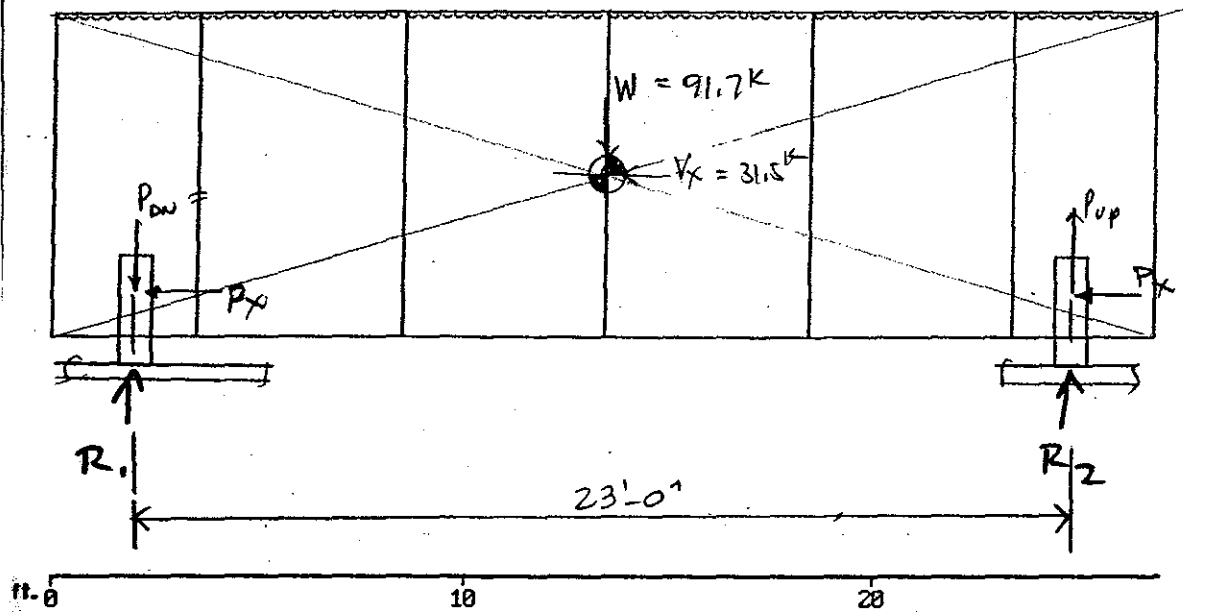


ASBURY ENVIRONMENTAL

CHICO TRANSFER SITE

TANK SADDLE RETROFIT
SECTIONS AND DETAILS
10,000 gallon Tank

DATE: 09/21/02 PROJECT NO.: 1333
SHEET: 1 OF 2 DRAWING NO.: 5152C001
REV: A



(2-SADDLE ONLY)

$$R_1 = R_2 = 45.85 \text{ k}$$

A. Assumed NO SLIDING: LONGITUDINAL SEISMIC

$$W = 91.7 \text{ K}$$

$$V_x = 31.5 \text{ K}$$

O.T.M. @ BOT. OF SLAB

$$M_o = 31.5 (4.67 + 0.66) = 167.895 \text{ K}$$

$$P_{up/down} = 167.895 / 23 = 7.3 \text{ K}$$

VERT. WEIGHT DUE TO DL

$$R = 45.85 \text{ K} > 7.3 \text{ K} \text{ NO UPLIFT.}$$

$$\times 0.85$$

$$38.97 > 7.3 \text{ NO UPLIFT}$$

PROJECT ~~EVERGREEN~~ OTC ASBURY

CONTRACT NO. 5152 30558

SUBJECT CHICO TRANSFER SITE

DESIGNED *PA*

CLIENT REF.

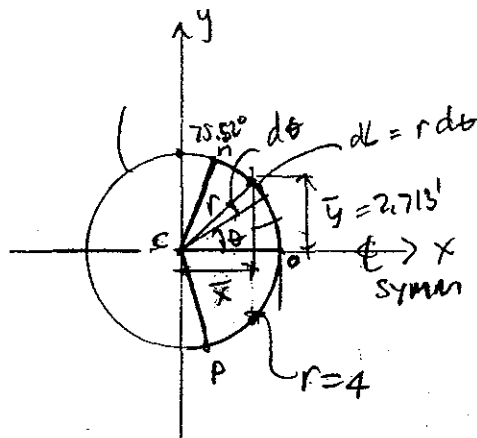
DATE 9/19/97

CHECKED *SA*

DATE 1/03

CONC. SHADE

A. LOCATION CENTROID OF ARC NOP

TAKE $\frac{1}{2}$ ARC NO BECAUSE OF SYMMETRY

$$L = \int r d\theta$$

$$m_y = L \times r \cos \theta$$

$$= \int r \cos \theta (r d\theta) = \int r^2 \cos \theta d\theta$$

$$\bar{X} = \frac{m_y}{A_{arc}} = \frac{r^2}{5.27} \int_0^{75.52} \cos \theta d\theta$$

$$\bar{X} = \frac{16}{5.27} (\sin \theta)_0^{75.52} = \frac{16}{5.27} (\sin 75.52^\circ - \sin 0)$$

$$= 2.939'$$

$$\bar{Y} = (4^2 - 2.939^2)^{1/2} = 2.713'$$

A FOR 75.52°

$$A_{arc} = \frac{\pi}{180} \times 75.52 \times 4 = 5.27'$$

$$\text{BUT } X_n = 4 - 2.939 = 1.061'$$

PROJECT EVERGREEN OILCONTRACT NO. 515230558
CLIENT REF.SUBJECT CHICO TRANSFER SITEDESIGNED PRDATE 9/19/97CHECKED SJADATE 1/03

FOUNDATION DESIGN - CONCRETE SKIDOLE

A. DESIGN FOR VERTICAL LOAD + LONGITUDINAL SEISMIC

$$F_x = 31.5/2 = 15.75 \text{ K} / \text{PEDESTAL}$$

$$\text{LET } b = 3'-2"$$

$$L = 9'-0" + 2(8")$$

$$L_{\text{eff}} = 10.33'$$

$$P_{DN} = 38.97 - 7.3 = 31.7 \text{ K}$$

$$0.7M \text{ @ BOTTOM OF SLAB LET } h = 0.67 + 0.67 + 1.06 = 2.4'$$

$$M_0 = 15.75 \times 2.4 = 37.8 \text{ K-ft} ; M_0 = 37.8 / 10.33 = 3.66 \text{ K/ft}$$

$$1.0 \text{ WEIGHT OF FOOTING: } R = 4'-0" \text{ ARC} = 10.54' \text{ } b = 3.0', \gamma = 7.74'$$

$$\text{PEDESTAL (REV)} \quad W_1 = 0.15 \left[\frac{(10.54 \times 4 - 7.74(4-3))}{2} + 3.67 \times 9 \right] 1.83'$$

$$= 0.15 (-17.21 + 33.03) 1.83 = 4.35 \text{ K}$$

$$\text{SLAB} = 0.15 \times \frac{8}{12} (9 + 1.33) (1.83 + 1.33) = 3.26 \text{ K}$$

$$\Sigma FTG. = 7.61 \text{ K}$$

$$\text{TOTAL VERT } W_T = 31.7 + 7.61 = 39.3 \text{ K} ; W_T = 39.3 / 10.33 = 3.81 \text{ K/ft}$$

$$\text{RESISTING MOMENT ASSUMED } b = 1.833 + 1.33 = 3.167'$$

$$\text{RSM} = 39.3 \times 3.167 / 2 = 62.2 \text{ K-ft}$$

$$F.S. = 62.2 / 37.8 = 1.65 > 1.5 \text{ OK}$$

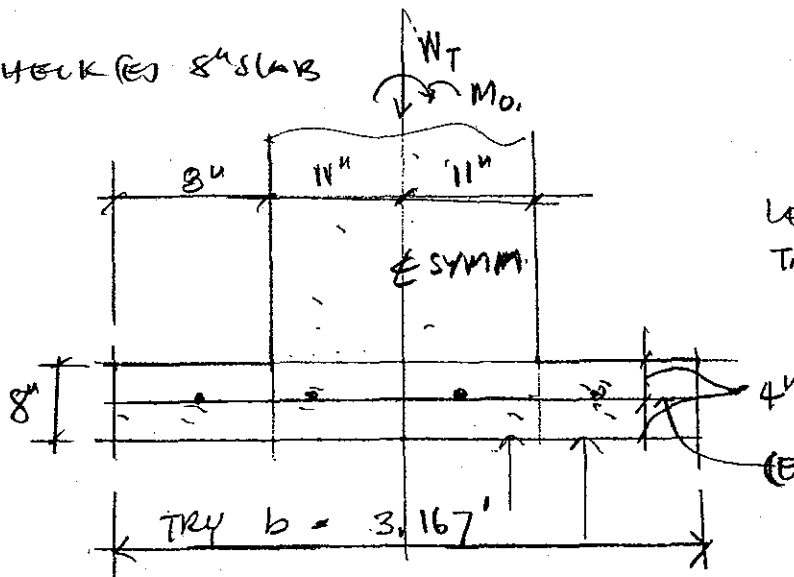


30558

PROJECT EVERGREEN OIL
SUBJECT CHICO TRANSFER SITECONTRACT NO. 5152 CLIENT REF.
DESIGNED [signature] DATE 9/19/97
CHECKED SJA DATE 1/03

CONC. SADDLE

1. CHECK (E) 8" SLAB



$$\begin{aligned} \text{LET } b &= 11 \times 2 = 22 + 8 \times 2 \\ \text{TRY } &= 38" = 3.167' \\ L &= 9' + 8 \times 2 = 10.33' \end{aligned}$$

$$e_x = 37.8 / 39.3 = 0.95'$$

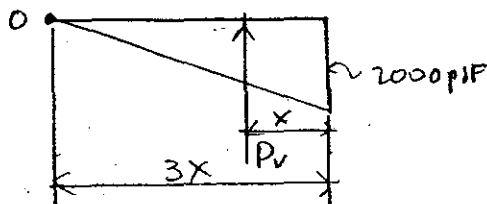
MAX SOIL PRESSURE

$$f_p = 39.3 \times 2 / 3 \times (1.58 - 0.95)(10.33) = 4026 \text{ PSF (TOP)} \\ \text{N.G.} \\ \text{INCREASE WIDTH "b"}$$

2.0 REVISE FOOTING WIDTH "b"

TRY MAX. SOIL PRESSURE OF 2000 PSF, $L = 10.33'$

$$e_{P_v} = W_T$$



$$2000(3X)10.33 = 38950 \times 2$$

$$X = 1.26'$$

$$3X = 3.78$$

REQ'D WIDTH b

$$b_h = 0.95 + 1.26 = 2.21'$$

$$b = 4.42 > 3.78$$

TAKE 1/2 STRIP

$$V_x = 1316 \times 1.293 + 684 \times 1.293/2 = 1702 + 442 \\ e_{\text{TOP}} = 2144$$

$$\text{SHEAR } V_c = 2144 / 12 \times 4 = 44.7 \text{ psi} < 1.1 \sqrt{f'_c} \\ \text{CONC. } b = 12" \text{ } d = 4"$$



PROJECT EVER GREEN OIL

CONTRACT NO. 5152

CLIENT REF.

SUBJECT CHICO TRANSFER SITE

DESIGNED PR

DATE 9/19/97

CHECKED SQU

DATE 1/03

A. DL + LONGITUDINAL SEISMIC

2.0 REVERSED "b"

$$\text{FLEXURE } M_{x_{\text{FLEX}}} = 1702 \times \frac{1.293}{2} + 442 \times 1.293 \times \frac{2}{3}$$

$$= 1100.4 + 381 = 1481.4 \text{ l-}\#$$

$$M_u = 1.4025 \times 1481.4 = 2078 \text{ l-}\#$$

CAPACITY OF 8" SLAB WITH #4 BARS @ 12" O.C.

$$\text{LET } f_c' = 2500 \text{ psi} \quad d = 4"$$

$$F_y = 40 \text{ ksi}$$

$$a = 0.2 \times 40 / (0.85 \times 2.5 \times 12) = 0.31"$$

$$\phi M_N = 0.9 \times 0.2 \times 40 \left(4 - \frac{0.31}{2} \right) \frac{1}{12} = 2.307 \text{ l-k} > 2.078 \text{ l-k OK}$$

2.1 TRY IF MAX SOIL PRESSURE IS 1500 PSF

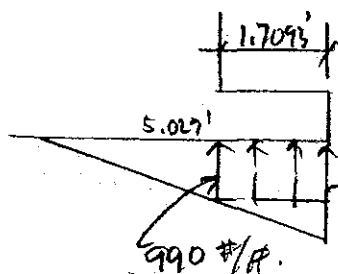
$$L = 10.33$$

$$1500 (3\%) \times 10.33 = 38950 \times 2$$

$$X = 1.676' ; 3\% = 5.027'$$

$$\frac{b}{2} = 0.95 + 1.676 = 2.626 ; b = 5.252' > 5.027' \text{ OK}$$

TAKE 12" STRIP



$$V_{x_{\text{FLEX}}} = 990 \times 1.7093 + 510 \times \frac{1.7093}{2}$$

$$= 1692 + 436 = 2128 \#$$

$$\text{SHEAR } V_c = 2128 / (12 \times 4) = 44.4 \text{ psi} < 1.1 \sqrt{f_c'}$$



PROJECT EVERGREEN OIL

CONTRACT NO. 5152 CLIENT REF.

SUBJECT CHICO TRANSFER SITE

DESIGNED PR DATE 9/19/97

CHECKED SDA DATE 1/03

A. BLT LONGITUDINAL seismic

2.1 $b = 5.252'$

$$M_{x_{Fout}} = 1692 \times 1.7093/2 + 436 \times 1.7093 \times 2/3$$

$$= 1446 + 497 = 1943 \text{ l-ft}$$

$$M_u = 1.4 \times 1943 = 2720 \text{ l-ft} > 2307 \text{ l-ft}$$

$$\text{IF } F_y = 60 \text{ ksi } f'_c = 2500 \text{ psi}$$

$$\phi M_n = 3400 \text{ l-ft} > 2720 \text{ l-ft} \text{ OK.}$$

3.0 CHECK REINF. PEDESTAL

SHEAR AT PEDESTAL = 15750 #

O.T.M. @ BASE OF PEDESTAL

$$M_o = 15.75(0.67 + 1.06) = 27.25 \text{ l-k}$$

TRY 30-BOWELS

$$\text{SHEAR / BOWEL } P_v = 15750 / 30 = 525 \text{ # / BOWEL}$$

$$\text{TENSION / BOWEL } = P_T = \frac{27250 \times 12}{20 \times 7/8 \times 13} = 1437 \text{ # / BOWEL.}$$

#5 REBARS w/ HILTI HIT HY-150 ADHESIVE
WITH 5" MIN EMBEDMENT

$$B_v = 3050 \text{ # / BAR}$$

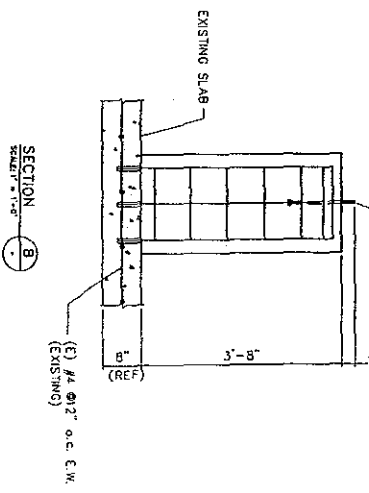
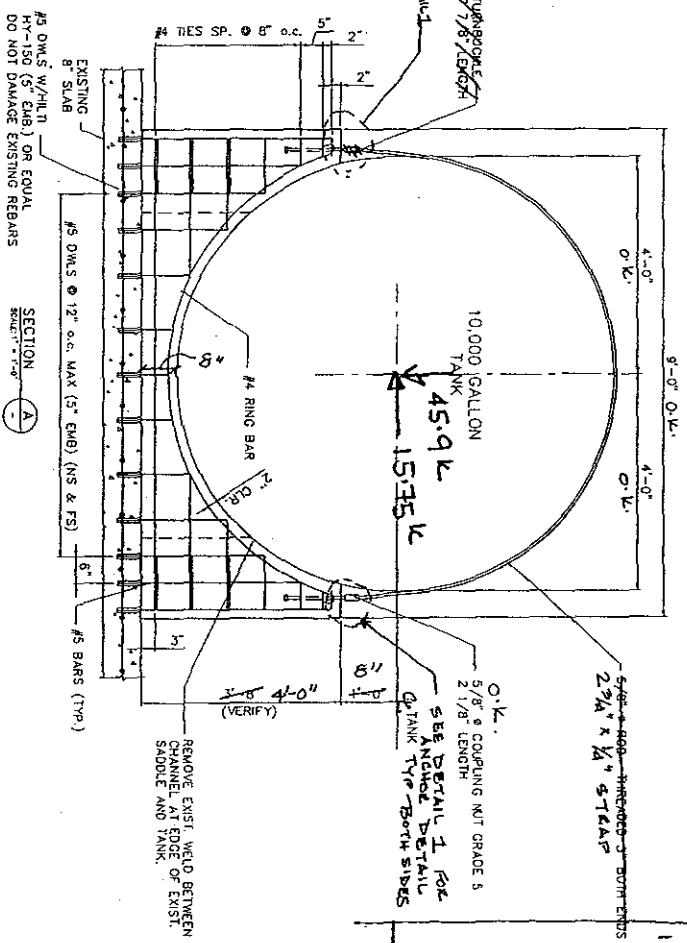
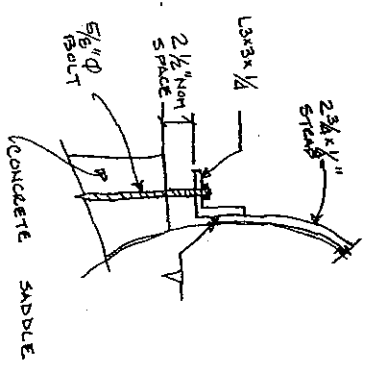
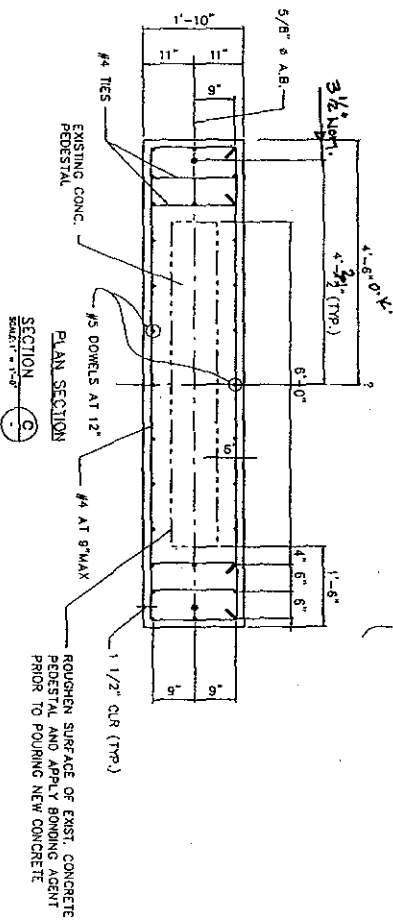
$$B_T = 2625 \text{ # / BAR}$$

COMBINED FORCES

$$\sum P_i / B_i = \frac{525}{3050} + \frac{1437}{2625} = 0.72 < 1.0 \text{ OK}$$

HILTI-HIT-150 ADHESIVE

#5 x 5" MIN. EMBEDD. ONLY.



TRANSVERSE SEISMIC LOAD

1. ULLAGE LOAD AT TYP
 $f_p = 45.96(1.83) = 83.94 \text{ ksf}$

2. H₀₁ @ BASE TO SLAB
 $H_{01} = 15.75(4.67) = 73.6 \text{ k-ft}$

3. H₀₁ @ 50' SLAB
 $H_{01} = 15.75(5.33) = 83.94 \text{ k-ft}$

4. R₀₁ @ 50' OF SLAB FOR
 $H_{01} = 45.9 \times 4.5 \times 0.85 = 175.6 \text{ k-ft}$

5. F.S. = $175.6/83.95 = 2.09 > 1.5$: O.K.

- NOTES:**
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
 - REINFORCING STEEL SHALL BE ASTM A615 GRADE 60.
 - BONDING AGENT SHALL BE "MASTREBUILDERS" CONCRETE LIQUID UPL OR APPROVED EQUAL. SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 - DOWEL BARS SHALL BE INSTALLED WITH HILTI HY-150 ADHESIVE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 - ANCHOR BOLTS SHALL BE ASTM A-307.

AS-BUILT CONDITIONS
 SEE FIELD MEMORANDUM
 & SITE VISIT ON
 1/21/03 BY EICHELEY

SK-02

NO.	DATE	BY	DESCRIPTION
1	1/21/03	SK-02	REVISION

Eicheley

1380 North Park Road, Suite 400, Chino, CA 91708
 (916) 847-7000 x 742 (916) 847-7008
ASTROCK ELLIOTT/CHICAGO
 CHICAGO, IL 60612

CHICO TRANSFER SITE

TANK SADDLE RETROFIT SECTIONS AND DETAILS
 10,000 gallon Tank

DATE: 9/10/02 PROJECT NO.: 1531
 DRAWN BY: J. J. J. CHECKED BY: J. J. J.
 SCALE: 1" = 1'-0" 1/4" = 1'-0" 1/8" = 1'-0"

5152C001

9/19
 305558
 A2-9



PROJECT EVERGREEN OIL

CONTRACT NO. 5152 30558

CLIENT REF.

SUBJECT CHICO TRANSFER SITE

DESIGNED R

DATE 9/19/97

CHECKED

DATE

CONC. SADDLE

B. CHECK FOR OLT TRANSVERSE SEISMIC FORCE

2.0 CHECK FOR MAX. SOIL PRESSURE AND SLAB

TOTAL VERTICAL LOAD

$$\text{PEDESTAL} = 4.35 \text{ K}$$

$$\text{SLAB} = 3.26$$

$$\text{TANK} = 45.9 \times .85 = 39.02$$

$$\underline{46.61 \text{ K}}$$

$$\text{DESIGNATED } e_p = 83.95 / 46.61 = 1.8' > L/6 = 1.72'$$

$$\text{TRY } b = 4.42', L = 10.33'$$

$$c' = \frac{10.33}{2} - 1.8 = 3.365'$$

MAX. SOIL PRESSURE

$$f_p = 2 \times 46.61 / (3 \times 3.365 \times 4.42) = 1045 \text{ psf} < 1500 \text{ psf}$$

OK

BY INSPECTION #4 ER MAX. REBAR IS OK

3.0 CHECK DOWELS.

TRY 30 DOWELS — #5 HULTI HLT HY-150 ADHESIVE

MAX. TENSION ON DOWELS

W/ 5" MIN. EMBEDMENT

$$P_T = \frac{83950}{9 \times 0.8 \times 8_{\text{DOF DOWEL}}} = 1457 \text{ #/DOWEL}$$

$$\text{SHEAR/DOWELS } P_V = 15750 / 30 = 525 \text{ #}$$

COMBINED FORCE

$$\Sigma P_i / b_i = \frac{525}{3050} + 1457 / 2625 = 0.73 < 1.0 \text{ OK.}$$



Eichleay Engineers Inc. of California

CALCULATION

SHEET 11 OF 19
30558

PROJECT EUGREEN DR

CONTRACT NO 5152

CLIENT REF.

SUBJECT CHICO TRANSFER SITE

DESIGNED PW

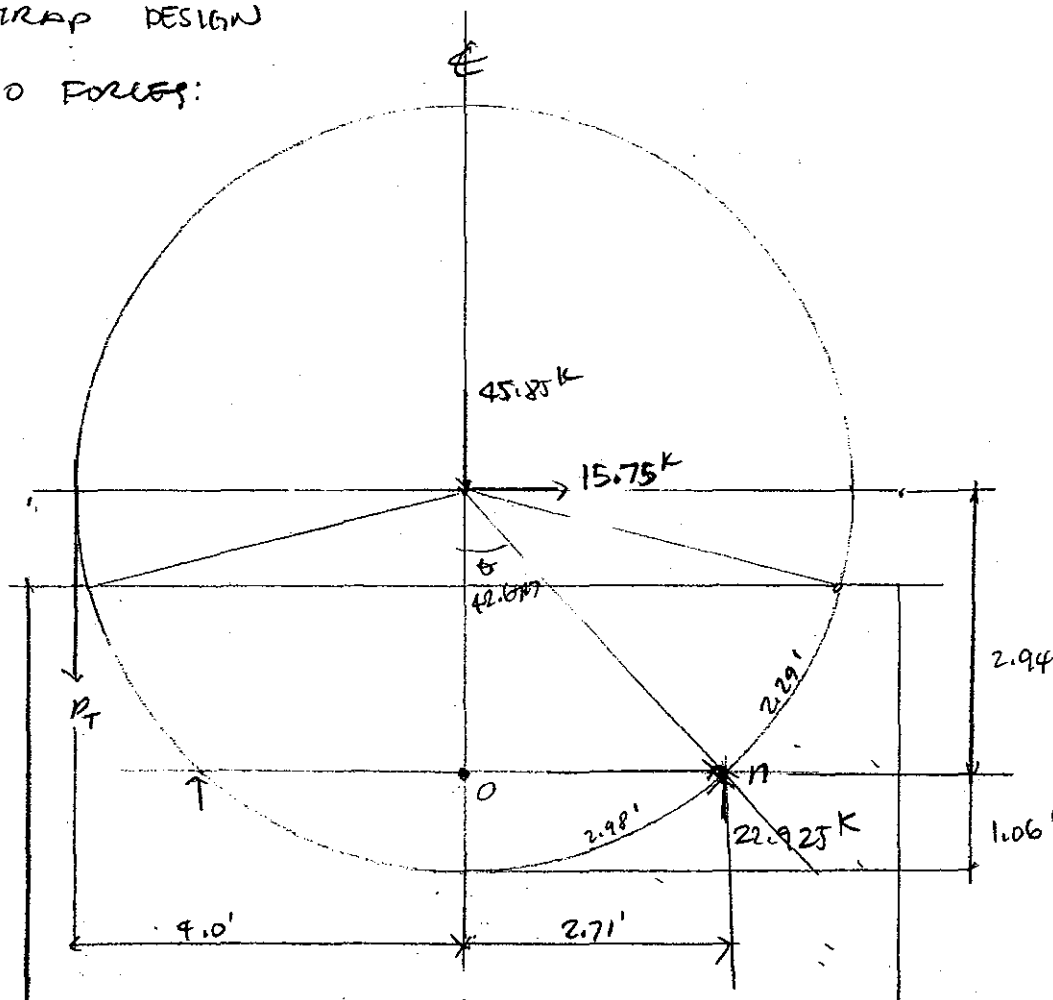
DATE 9/97

CHECKED SDA

DATE 1/03

C. STRAP DESIGN

1.0 FORCES:



$$\sum M_n = 0$$

$$M_n = 15.75 \times 2.94 - 45.85 \times 0.85 \times 2.71 = -59.3 \text{ K} \quad \text{NO UPPLY.}$$

IF FRICTION $\mu = 0.3$ (STEEL TO CONCRETE)

$$\text{SEISMIC} = 0.34370 W_p$$

$$\text{DIFF} = 0.04375$$

$$\text{ADDITIONAL FORCE } T = 0.04375 \times 45.85 / 0.3 = 6.69 \text{ K}$$

$$\text{TENSION/PAIR } P_T = 6.69 / 2 = 3350 \text{ #}$$

$$\text{TRY } 5/8 \text{ ROD (A307)} \quad B_T = 20 \times 0.31 = 6,200 \text{ #} > 3350 \text{ #}$$

$$\text{OR } 23/4 \text{ " } \times \text{ } 1/4 \text{ " STRAP } A = 0.69 \text{ in}^2$$

$$B_T = 20 \times 0.69 = 13,800 \text{ # } 1.0 \text{ K.}$$

CONSERV.



PROJECT EVERGREEN OIL

CONTRACT NO. 5152

30588

CLIENT REF.

SUBJECT CHICO TRANSFER SITE

DESIGNED RZ

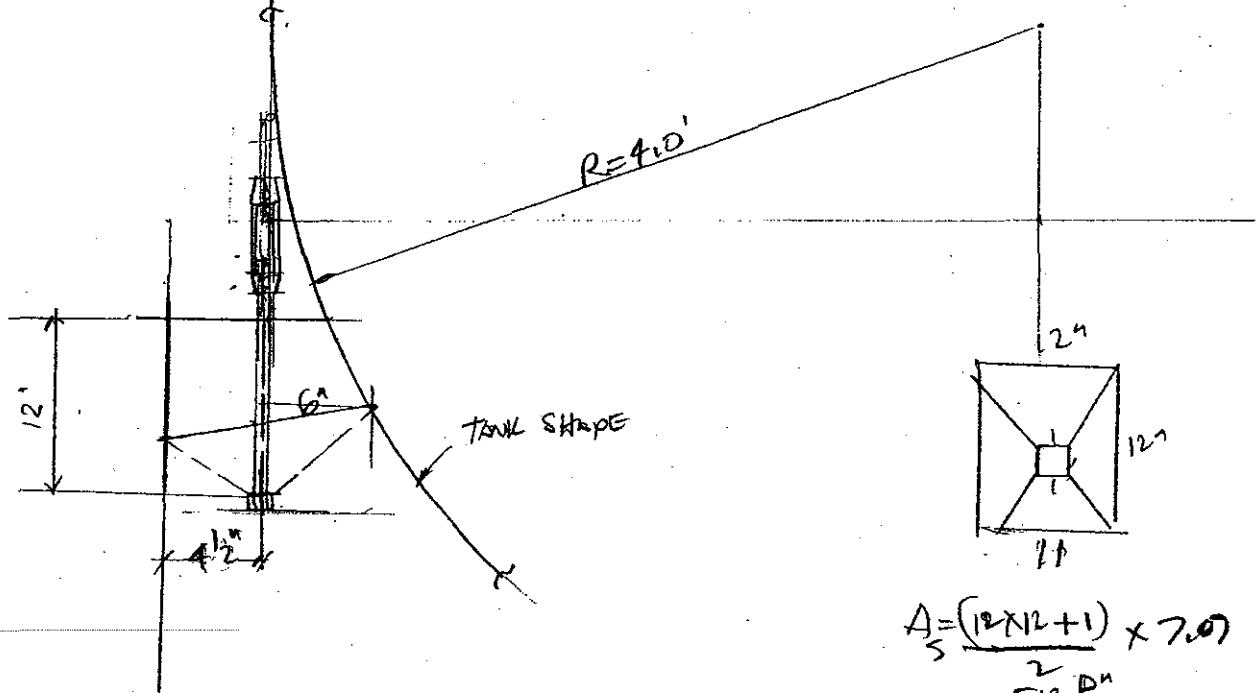
DATE 9/19/97

CHECKED SBA

DATE 1/03

C. STRAP ANCHOR.

2.0 ANCHORAGE OF STRAP.

TRY 5/8" ϕ X 12" EMBEDMENT.

SECTION 1925.3 UBC

DESIGN TENSION CAPACITY

$$\text{STEEL } P_s = 0.9 A_s f_s' = 0.9 \times 3.1 \times 60 = 16.74 \text{ K}$$

$$\text{CONC. } \phi P_c = \phi \lambda (2.8 A_s + 4 A_t) \sqrt{f_c'} \quad f_c' = 3000 \text{ psi}$$

$$\phi P_c = \phi (2.8 \times 512 + 4) \frac{(3000)}{1000} \lambda$$

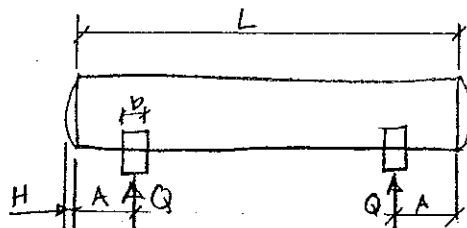
$$\phi P_c = 78.7 \text{ K} \phi = 51.1 \text{ K} > 16.74 \text{ K} \quad \text{STEEL GOVERNS,}$$

$$P_u = 3.35 \times 2 \times 1.4 = 9.38 \text{ K} < 16.74 \text{ K} \quad \text{OK}$$



PROJECT ASBURY - CHICO TRANSFER SITE CONTRACT NO. 30558 CLIENT REF. _____
 SUBJECT TANK CERTIFICATIONS DESIGNED S. Achary DATE 1/30/03
STRUCTURAL INTEGRITY OF TANK SHELL CHECKED _____ DATE _____

10,000 GALLON TANK



$$V = 10,000 \text{ GALLONS}$$

$$W_T = 83,420 + 8280 = 91,700 \text{ lb}$$

$$Q = W_T/2 = 45,850 \text{ lb}$$

$$L = 27 \text{ ft} \quad \text{OVERALL} = 27' 4''$$

$$H = 2' = 0.17 \text{ ft}$$

$$A = 3 \text{ ft}$$

$$\theta = 150^\circ$$

$$t = 0.24 \text{ in (FROM UT Report)}$$

$$r = 48 \text{ in}$$

$$R = 4 \text{ ft}$$

$$b = 22 \text{ in}$$

USE ZICK ANALYSIS

WORST CASE STRESS IS CIRCUMF. STRESS AT HORN OF SADDLE

PER ZICK:

$$S_3 = \frac{-Q}{4t(b+10t)} - \frac{12K_3QR}{Lt^2} \quad \text{for } L < 8R \quad (32 \text{ ft})$$

$$= \frac{-45,850}{4(0.24)(22+10(0.24))} - \frac{12(0.0079)(45,850)(4)}{27(0.24)^2}$$

$K_3 = 0.0079$ Per Table 1

$$= -1957 - 11,179$$

$$= 13,136 \text{ psi}$$

ALLOWABLE STRESS PER PV ELITE

MATERIAL SA 283-A Allowable $14,950 \text{ psi}$

$$S_3 < S_{\text{allow}} \quad \therefore \text{O.K.}$$



Eichleay Engineers Inc. of California

CALCULATION

SHEET 14 OF 19

PROJECT ASBURY - CHICO TRANSFERSITE CONTRACT NO. 30568 CLIENT REF. _____

SUBJECT TANK CERTIFICATIONS DESIGNED S. Ashcraft DATE 1/30/03

STRUCTURAL INTEGRITY OF TANK
SHELL CHECKED _____ DATE _____

$$\frac{1,000}{5} \frac{\text{GALLON}}{3} \frac{\text{ANTIFREEZE}}{3} - \text{S.G.} = 1.3$$

$$L = 12 \text{ ft}$$

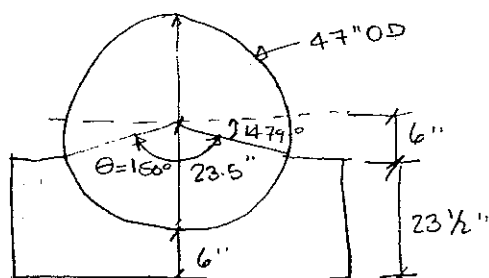
OVERALL LENGTH = 12'-3"

$$H = 1.6 \text{ in} = 0.125 \text{ ft}$$

$R = 1.95 \text{ ft}$ - radius

$$r = 23.4 \text{ in} - \text{radius.}$$

$t = 0.125$ in FROM CONAM REPORT & CONFIRMED BY TOMAL REPORT



$$\theta = 150^\circ$$

$$b = 12 \text{ in}$$

$$V = 1,000 \text{ GALLONS.}$$

WT CONTENTS.

$$V = \pi (1.95)^2 \times 12.25 = 146.3 \text{ ft}^3$$

$$W_T = 146.3 \times 62.4 \times 1.3 = 11,871 \text{ lb}$$

$$W_{\text{SHELL}} = \left[\pi \left(\frac{47}{12} \right) (12.25) \left(\frac{0.125}{12} \right) + 2 \left(\pi \right) (1.95)^2 \left(\frac{0.125}{12} \right) \right] \frac{49016}{ft^3}$$

$$= 892 \text{ lb}$$

TOTAL WT = 11,871 + 892 = 12,763 lb say 13,000 lb

$$Q = 13,000/2 = 6500 \text{ lb}$$

Max CIRCUM STRESS:

$$S_3 = \frac{-6500}{4(0.125)(12 + 10(0.125))} - \frac{12(0.0079)(6500)(1.95)}{12(0.125)^2}$$

$$= -981 - 6408$$

$$= -7,390 \text{ psi} < 16,950 \text{ psi allow.}$$

o.k.



Eichleay Engineers Inc. of California

CALCULATION

SHEET 15 OF 19

PROJECT ASBURY - CHICO TRANSFER SITE CONTRACT NO. 30558 CLIENT REF. _____
 SUBJECT TANK CERTIFICATION DESIGNED S. Adrauly DATE 1/30/03
STRUCTURAL INTEGRITY OF TANK SHELL CHECKED _____ DATE _____

500 GALLON WASTE OILSADDLE IS CONTINUOUS - $54\frac{1}{2}$ " LONG

$$L = 72" = 6 \text{ ft} \quad \text{OVERALL} = 73 \text{ in}$$

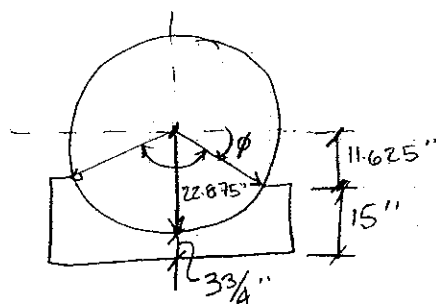
$$H = \frac{1}{2}" = 0.0417 \text{ ft}$$

$$\text{O.D.} = 45\frac{3}{4}"$$

$$E = 0.07 \text{ in FROM TOMAC REPORT}$$

$$R = 1.9 \text{ ft}$$

$$r = 22.8 \text{ in}$$



$$\phi = \arcsin \frac{11.625}{22.875} = 30.5^\circ$$

$$\theta \approx 120^\circ$$

$$V = 500 \text{ GALLONS}$$

$$W_{T \text{ CONT.}} = 67 \text{ ft}^3 \times 62.4 = 4181 \text{ lb}$$

$$W_{T \text{ SHELL}} \approx 500 \text{ lbs approx (CONSERV)}$$

$$W_{T \text{ TOTAL}} \approx 4700 \text{ lb}$$

$$P = 4700 \text{ lb} / \frac{54.5}{12} = 1035 \text{ lb/ft of Saddle}$$



PROJECT ASBURY - CHICO TRANSFERSITE CONTRACT NO. 30552 CLIENT REF. _____
SUBJECT TANK CERTIFICATION DESIGNED Adairly DATE 1/30/03
STRUCTURAL INTEGRITY OF TANK SHELL CHECKED _____ DATE _____

500 GALLON WASTE OIL

CHECK PER ROARK ARTICLE 12.7 5th Edition

$$\sigma_{max} = \frac{kP}{t^2} \ln \frac{R}{t}$$

$$\begin{aligned} \text{Where } k &= 0.02 - 0.00012(\beta - 90) \\ &= 0.02 - 0.00012(120 - 90) \\ &= 0.0164 \end{aligned}$$

$$\beta = 120^\circ$$

$$P = 103516$$

ASSUME SADDLE = 12 in

$$R = 1.9 \text{ ft} = 22.8 \text{ in}$$

$$t = 0.07 \text{ m}$$

$$\begin{aligned} \sigma_{max} &= \frac{1035}{(0.07)^2} (0.0164) \ln \left(\frac{22.8}{0.07} \right) \\ &= 20,043 \text{ psi} \end{aligned}$$

PER ROARK, THE MAX VALUE OF P THE PIPE CAN SUSTAIN IS ABOUT 2.25 times the value that will produce a maximum stress equal to the yield point of the pipe material, according to the formula given above

$$\text{Yield Stress} \approx 24,000 \text{ psi} > \sigma_{max} \therefore O.K.$$

SHELL THICKNESS ADEQUATE



Eichleay Engineers Inc. of California

CALCULATION

SHEET 17 OF 19

PROJECT CHICO TRANSFER SITE

CONTRACT NO. 5152 30558

CLIENT REF.

SUBJECT CHECK OF MASONRY BLOCK WALL

DESIGNED TH

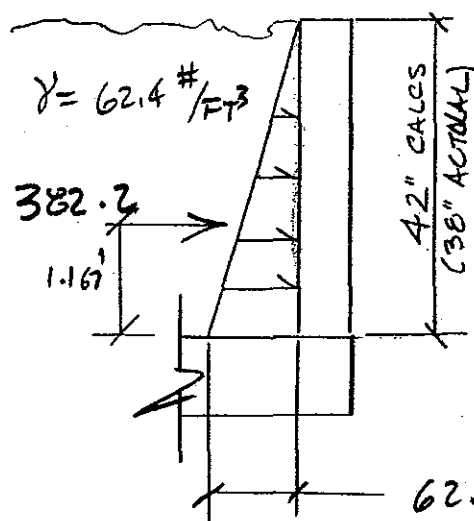
DATE 1997

STRUCTURAL INTEGRITY

CHECKED [Signature]

DATE 1/03

CHECK WALL FOR FULL HT. LIQUID
 ASSUME A 12" WIDE STRIP OF WALL



$$62.4 (3.5') = 218.4 \text{ #/ft}$$

$$V = 218.4 \text{ #/ft} (3.5') (0.5')$$

$$= 382.2 \text{ #/ft WIDTH}$$

$$M_{\text{MAX}} = 382.2 \text{ #/ft} (1.1667') = 445.9 \text{ FT-LBS/FT}$$



Eichleay Engineers Inc. of California

CALCULATION

SHEET 218 OF 19

PROJECT	CHICO TRANSFER SITE	CONTRACT NO.	5152	30538
SUBJECT	CHECK OF MASONRY BLOCK WALL	DESIGNED	TH	CLIENT REF.
	STRUCTURAL INTEGRITY	CHECKED	SLA	DATE 1/97
				DATE 1/03

USING WORKING STRESS DESIGN

ASSUME $f'_m = 1500 \text{ psi}$, NO SPECIAL INSPECTION

REINFORCING APPEARS TO BE #4 @ 30" O.C.

$$A_s = \frac{.2}{2.5} = .08 \text{ IN}^2/\text{FT}$$

BASED ON PHOTOS
TAKEN DURING
CONSTRUCTION -
PHOTOS AT NORTHGATE
OFFICE. PHOTOS CONFIRM
DOWELING INTO SLAB

$$d \approx 54$$

$$\rho = \frac{A_s}{bd} = \frac{.08}{5(12)} = .0013 > .0007 \text{ OK}$$

$$n = \frac{29,000,000}{750(1500)} = 25.78$$

$$\rho n = .0335$$

$$k = \sqrt{2(.0335) + (.0335)^2} - .0335$$

$$k = .2275$$

$$j = 1 - \frac{k}{3} = .9242$$

$$F_s = \frac{m}{A_s j d} = \frac{445.9(12)}{.08(.9242)(5)} = 14.5 \text{ ksi}$$

$$F_m = \frac{2m}{jkbd^2} = \frac{2(445.9)(12)}{.9242(.2275)(12)(5)^2} = 169 \text{ psi}$$



Eichleay Engineers Inc. of California

CALCULATION

SHEET 19 of 19

PROJECT	CHICO TRANSFER SITE	CONTRACT NO	5152	30556	CLIENT REF.	
SUBJECT	CHECK OF MASONRY BLOCK WALL	DESIGNED	TH		DATE	1997
	STRUCTURAL INTEGRITY	CHECKED	<i>[Signature]</i>		DATE	1/03

$$F_b = .33 f'_m = .33 (1500)$$

$$F_b = 495 \text{ psi} > f_m \quad \text{OK}$$

Assume GRADE 40 BAR

$$F_s = .5 (40,000)$$

$$= 20,000 \text{ psi} > f_s \quad \underline{\text{OK}}$$

FOUNDATION OK BY INSPECTION

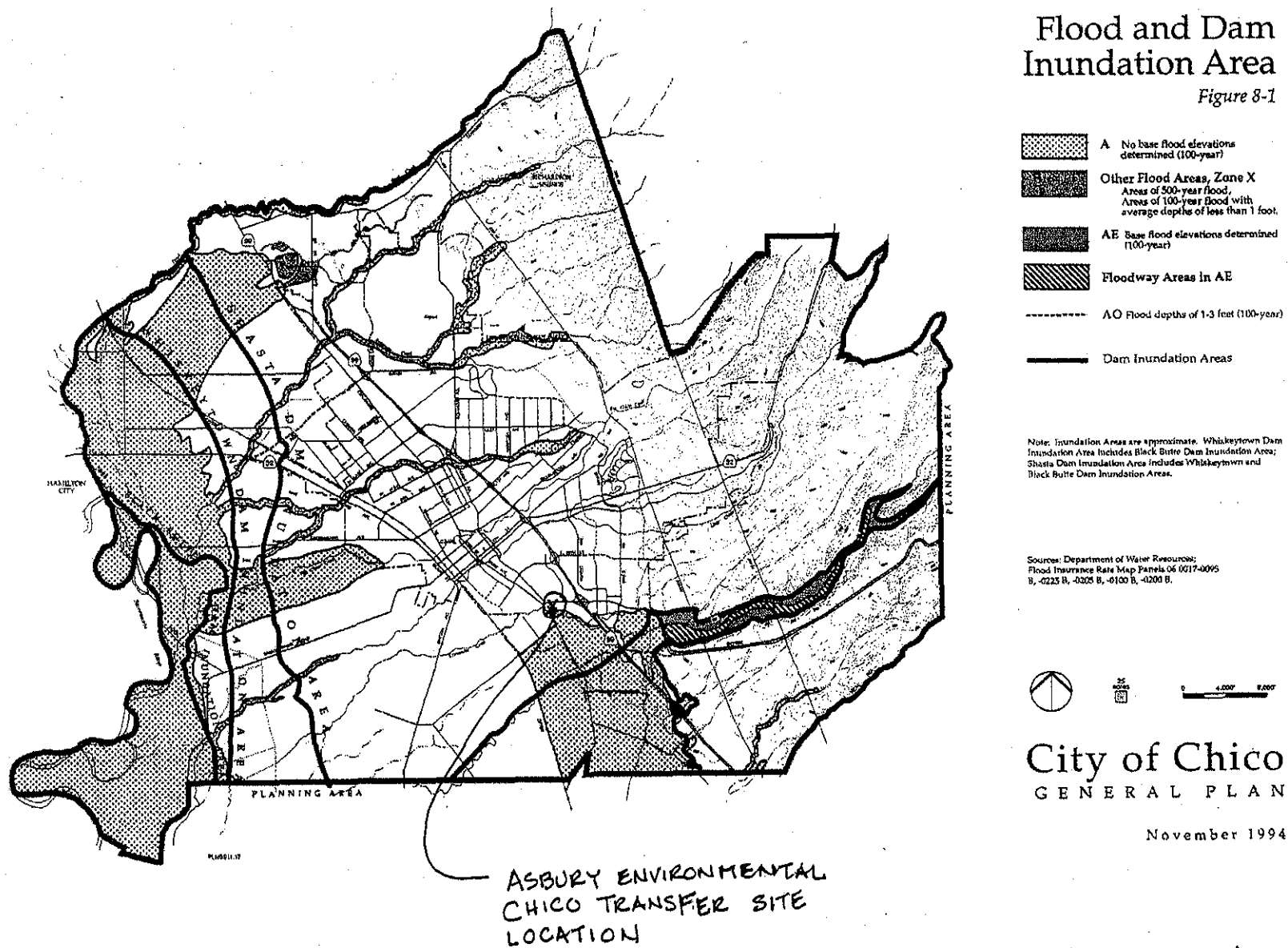
**Asbury Environmental Services
Chico Transfer Site
2549 Scott Ave.
Chico, CA 95928**

Attachment No. 3

**Excerpts from Chico General Plan
Flood & Seismicity**

Flood and Dam Inundation Area

Figure 8-1



LOCATION IS OUTSIDE 100 YEAR FLOODPLAIN (REF TITLE 22, SECTION 66270.4 b.11.B)

P&S # 30556
A3-1

8.2 SEISMIC AND GEOLOGIC HAZARDS

SITE MEETS SEISMIC STANDARD - NO FAULT WITHIN 3,000 FT. OF FACILITY

Seismic and geologic hazards represent constraints on development that need to be considered in the General Plan to protect public health and safety. Section 10.5 of the *Master Environmental Assessment* provides a detailed discussion of the seismic and geologic hazards in the Planning Area. A summary follows.

SEISMICITY

SEE FLOOD & DAM INUNDATION AREA
FOR OUTLINE & LOCATION OF TRANSFER
SITE

The Planning Area is located in one of the least active seismic regions in California (Classified by the state as Seismic Hazard Zone 3). There are no active (those that have moved in Holocene time, i.e. last 11,000 years) faults in the Planning Area. The Cleveland Hill Fault is the closest active fault to the Planning Area, approximately 17 miles southeast.

The potentially active Monocline Fault transverses the eastern portion of the Planning Area from the northwest to the southeast. Potentially active faults are those that have moved in Pleistocene time (11,000 - 1.8 million years) and the probability of a significant earthquake occurring is considered low. Additionally, the potentially active Foothills Shear Zone lies adjacent to the southeast corner of the Planning Area.

SEISMIC RISK TO DEVELOPMENT

Fault Rupture. The state has not designated any Alquist-Priolo Special Studies Zones within the Planning Area, nor are there any known or inferred active faults. Thus, the potential for ground rupture within Chico is considered very low. Known existing faults in the Planning Area are mapped in Figure 8 of the MEA.

Ground Shaking. Earthquakes generated on the active Cleveland Hill, Last Chance-Honey Lake, and Midland-Sweitzer faults could result in strong ground shaking within the City.

Liquefaction. There is a high potential for liquefaction in the Planning Area along the Sacramento River and a moderate potential for liquefaction in the area east from the Sacramento River to Highway 99. East of Highway 99, there is a generally low potential for liquefaction, except for areas along stream channels.

Unreinforced Masonry Buildings (URMs). The state's comprehensive URM law, which mandates certain actions for cities, is applicable only to cities located in Seismic Hazard Zone 4 or higher; the Planning Area is in Seismic Zone 3.

The City requires a structural analysis for any proposed change in the type of occupancy of an unreinforced masonry building which results in an increased hazard to life and/or public safety. Under the authority of the Building Code, the City may require reinforcement of the building as a condition of approving a certificate for the new occupancy. The objective of this policy is to ensure that there will be no increased risk to occupants of these buildings. However,